

CONTENTS

IBM 1402
READER-PUNCH
WIRING-DIAGRAM

20611

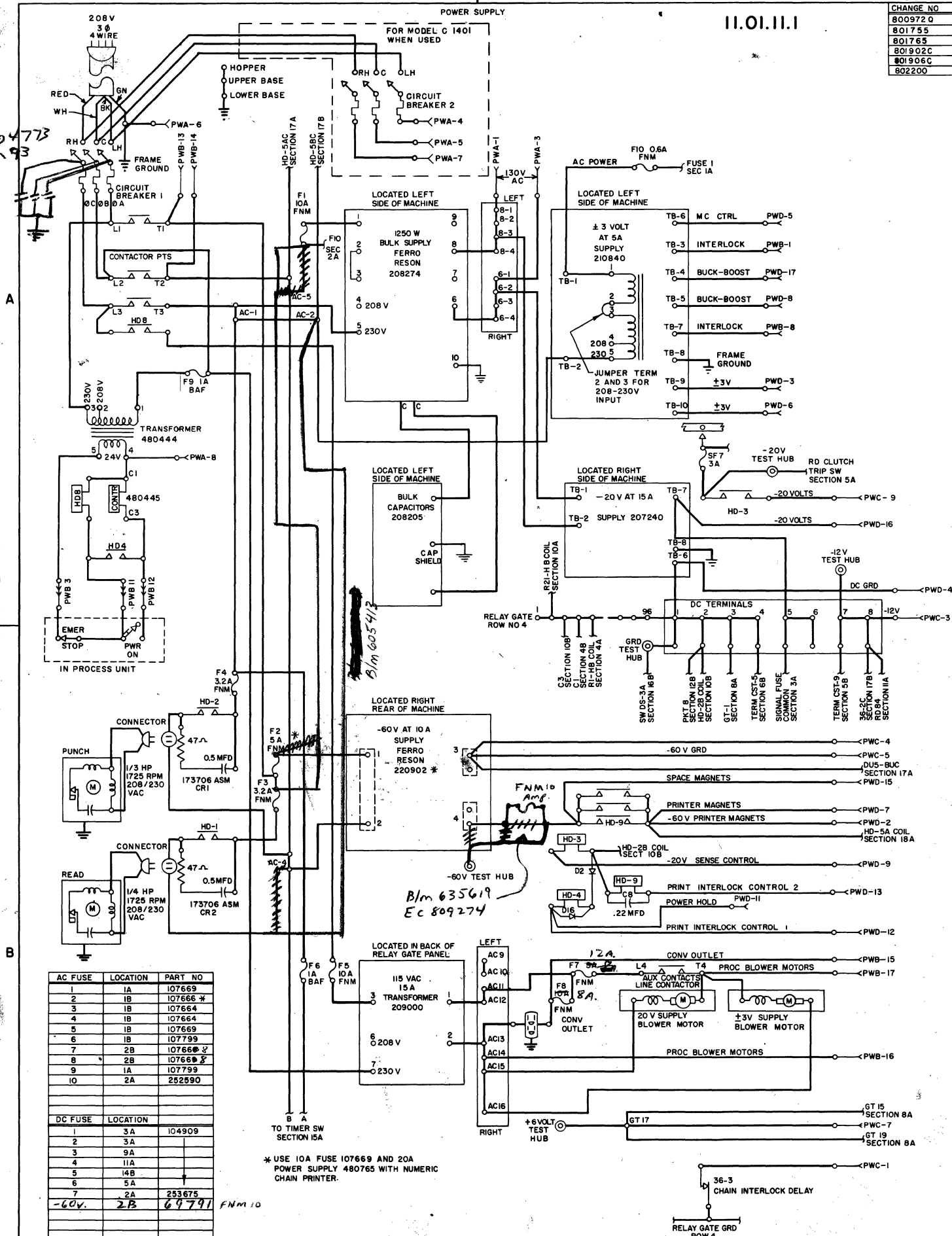
	PART NO	SECTION	DESCRIPTION	ENGINEERING CHANGE LEVEL					
				800972Q	801424G	801424R	801424S	801755	801765
	609400		CONTENTS	801902C	801902F	801906C	802200		
READER	609802	1-2	POWER SUPPLY	800972Q	801755	801765	801902C	801906C	802200
	609803	3-4	START AND RUN	800972Q	801424G	801424R	801755	801765	
	609804	5-6	CLUTCH	800972Q	801424S	801755	801765	801906C	
	609805	7-8	READ	800972Q	801755	801906C			
	609806	9-10	START AND RUN	800972Q	801424G	801424R	801424S	801765	801906C
PUNCH	609807	11-12	CLUTCH	800972Q	801424S	801755	801765	801902F	801906C
	609808	13-14	READ AND PUNCH	800972Q	801424S	801755	801902C	801902F	
	609809	15-16	C. E. AID	800972Q	801902C	801906C			
	609810	17-18	1403 INTERLOCKS	800972Q	801424G	801906C			
	609811	19-20	SWITCH LOCATIONS	800972Q	801755	801906C			
REFERENCE	609812	21-22	GENERAL	800972Q	801424G	801906C			
	609813	23-24	TIMING	800972Q	801424R	801755	801765		
	609814	25-26	CAM LOCATIONS	800972Q	801906C	802200			
	609815	27-28	TIMING	800972Q	801424R	801424S	801755	801765	801906C
	609816	29-30	TIMING	800972Q	801765				
	609817	31-32	CONNECTOR LOCATIONS	800972Q	801755	801765	801902C	801906C	802200
	609818	33-34	RESISTORS, CAPACITORS, AND DIODES	800972Q	801424G	801424S	801755	801765	801902C
	609819	35-36	RELAY GATE	801902F	801906C	802200			
	609820	37-38	RELAY LOCATION	800972Q	801424G	801424S	801755	801765	801902C
	609823	39-40	MECHANICAL TIMINGS	800972Q	801906C				

PART NO 609400 COMPLETE SET 1402 WIRING DIAGRAMS

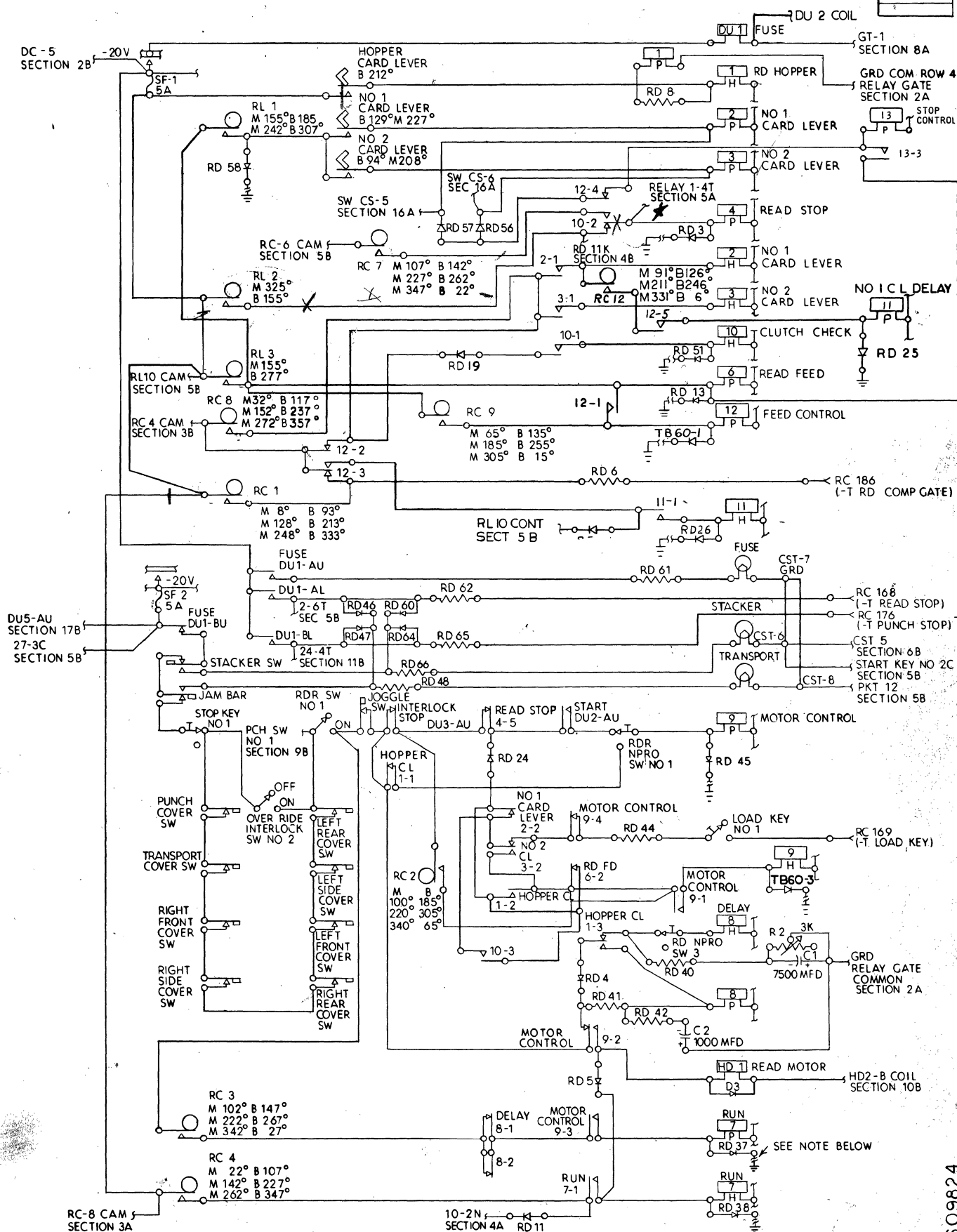
DATE	E.C.	DATE	E.C.	DATE	E.C.
4-25-60	800972Q	2-9-61	802200		
5-24-60	801424G				
6-15-60	801424R				
6-21-60	801424S				
8-18-60	801755				
9-19-60	801765				
10-17-60	801902C				
12-20-60	801902F				
12-30-60	801906C				

E.C. 802332 B/M 605219
 802334 B/M 605256
 802336 B/M 605258
 801983A 609008
 802542 605298
 802538 605263
 801983 PL. 17 timing change
 per Eng Letter 5/19/61

INTERNATIONAL BUSINESS MACHINES CORP					
NAME		WIRING DIAGRAM--			
READER, PUNCH					
DESIGN	JS	8-7-59	MODEL	1402	
DETAIL	OJB	8-7-59	SCALE	NONE	
CHECK	JS	8-7-59	DRAW	CES	1-9-60
APPRO	ADM	8-7-59	CHECK	LJF	1-11-60



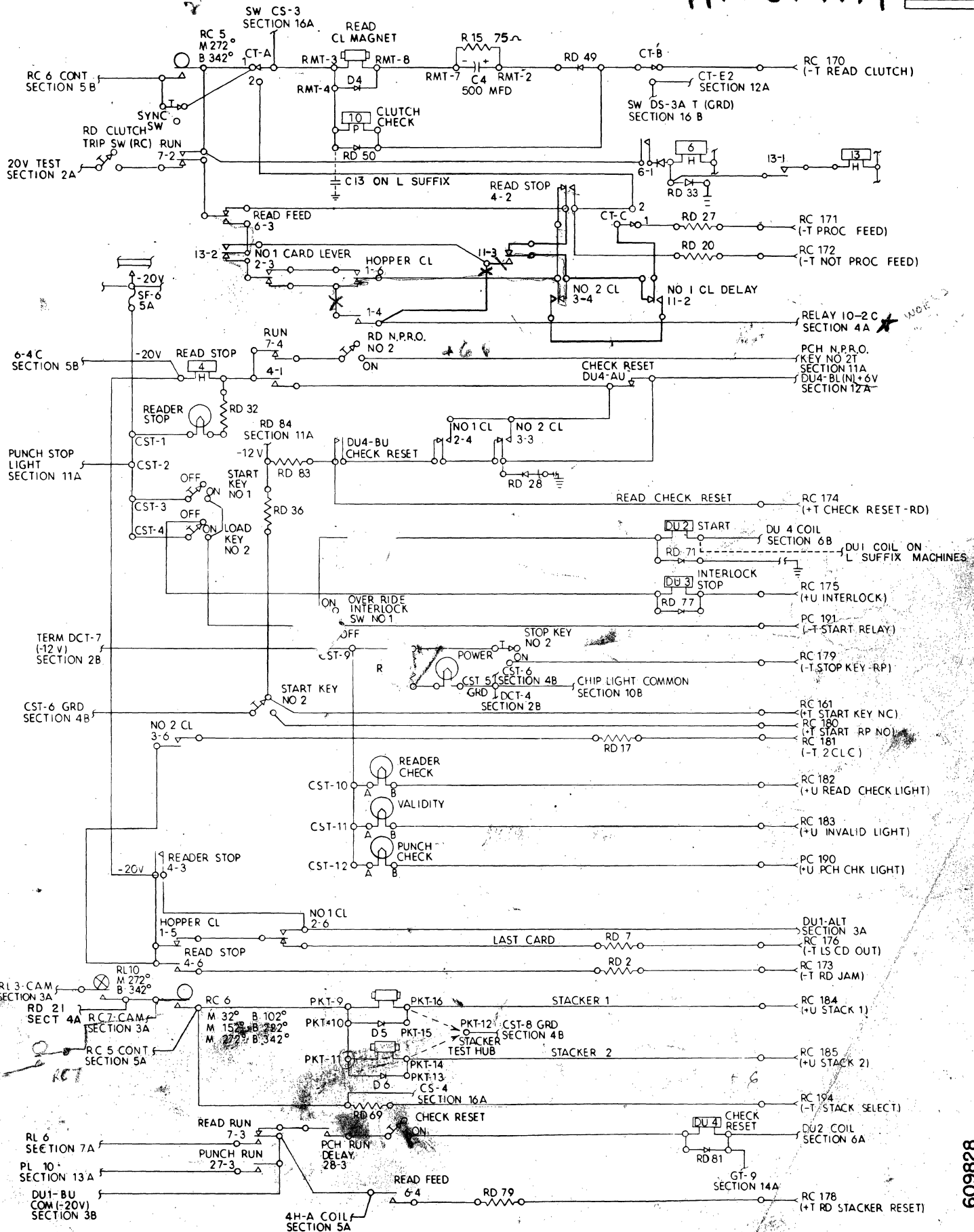
CHANGE NO
802620B
802928
802843A



NOTE WHERE DIODE GROUNDING IS INDICATED, ALL RD DIODES ARE PLUGGED TO GROUND COMMON ON ROW 4 OF RELAY GATE, WHICH IS RETURNED TO SYSTEM GROUND

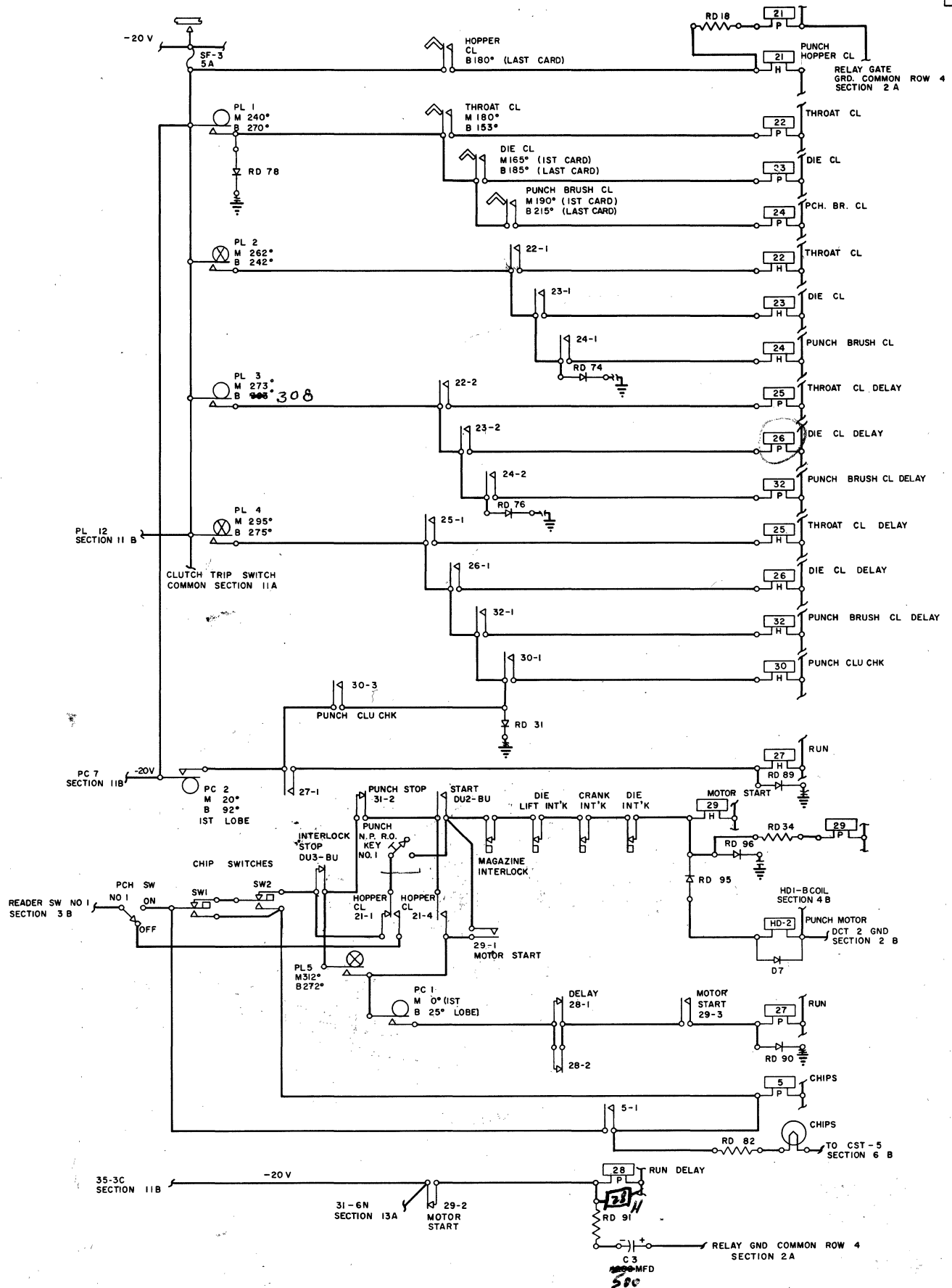
CHANGE NO
802620B
802643A
803330

11:03:11.1



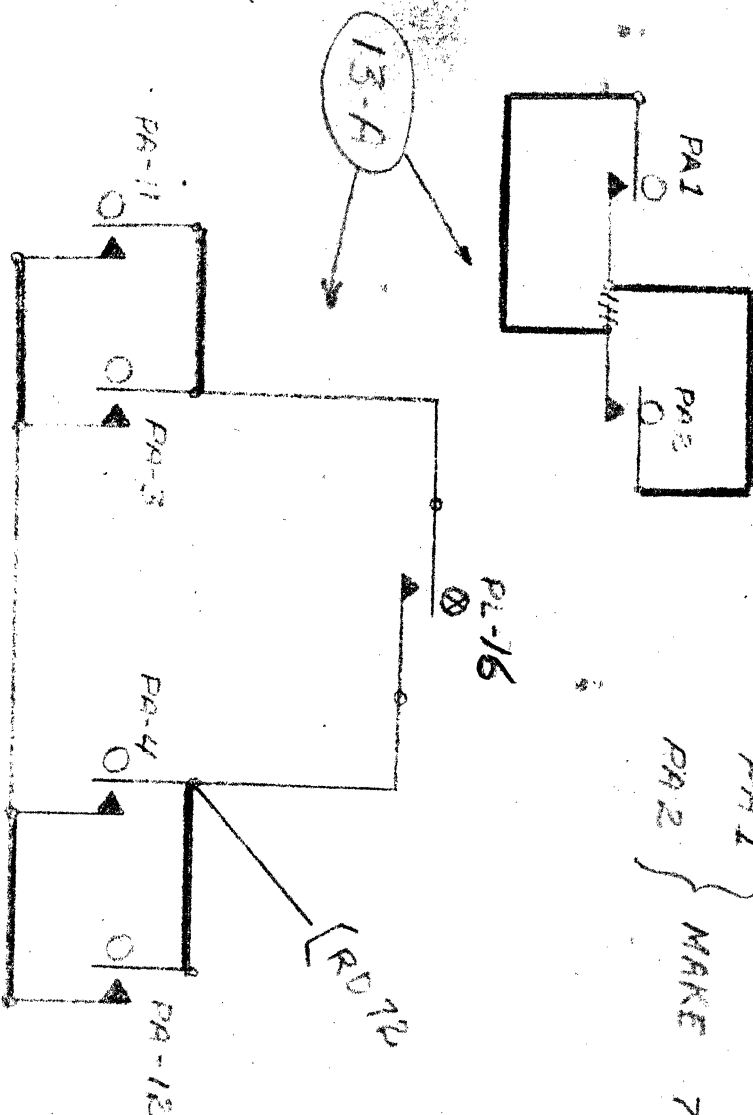
11.05.11.1

CHANGE NO
800972 Q
801424 G
801424 R
801424 S
801765
801906 C



E.C. 801983A

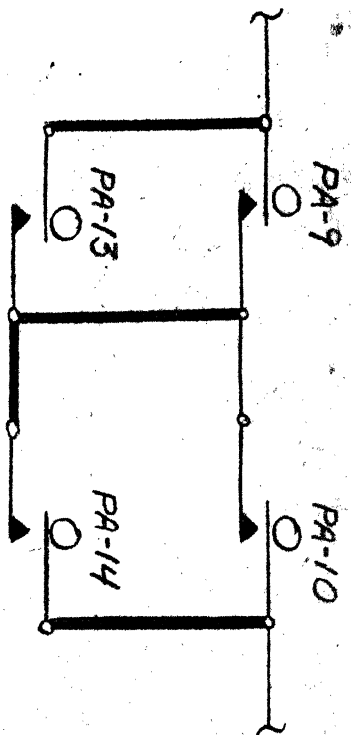
PA 1 } MAKE 72° ±2/-0
PA 2 }



PA-11 TIME SAME AS PA-3
PA-12 TIME SAME AS PA-4

CHANGE ON 1402 FOR
MISSING PUNCH 30MHS.

SECTION 13A LOGIC 11.07.11.1



— ADD

— EXISTING

PA-13 TIMED SAME AS PA-9

PA-14 TIMED SAME AS PA-10

FBM. 605298

E.C. 802542

CAM PART NO. 609029

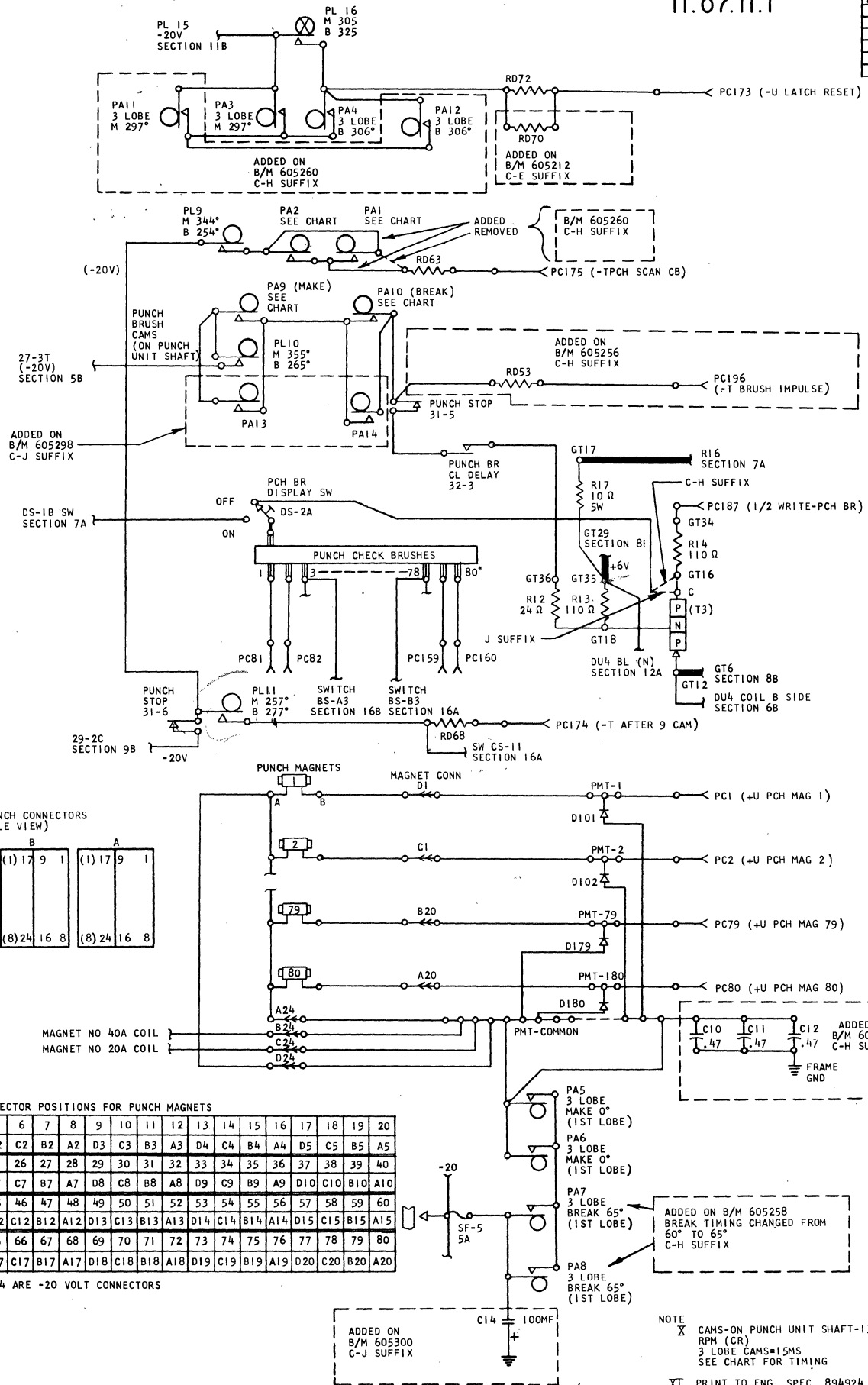
25° 3-LOBE

PUNCH READ AND PUNCH

11.07.11.1

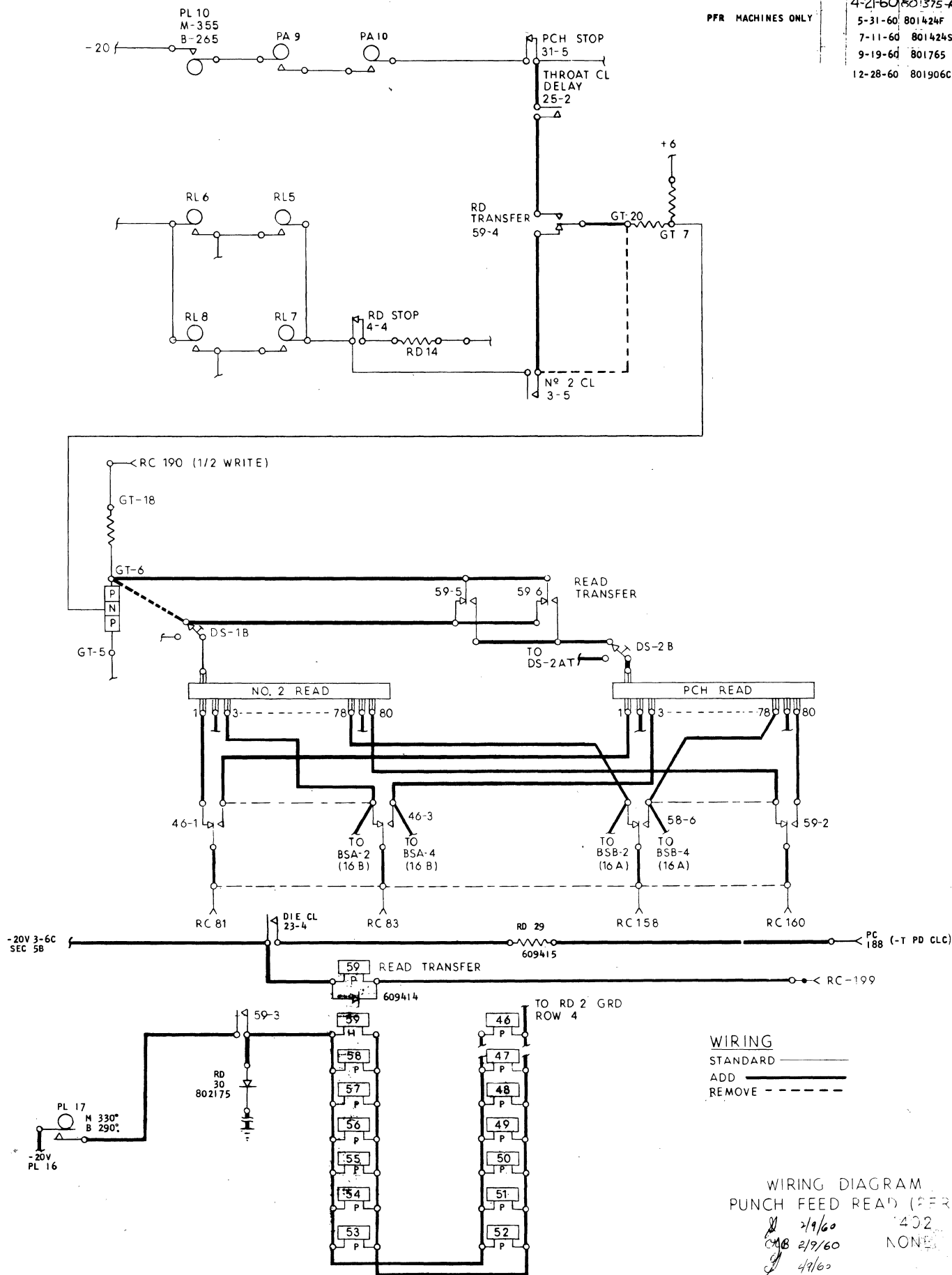
CHANGE NO

802B43K



PFR MACHINES ONLY

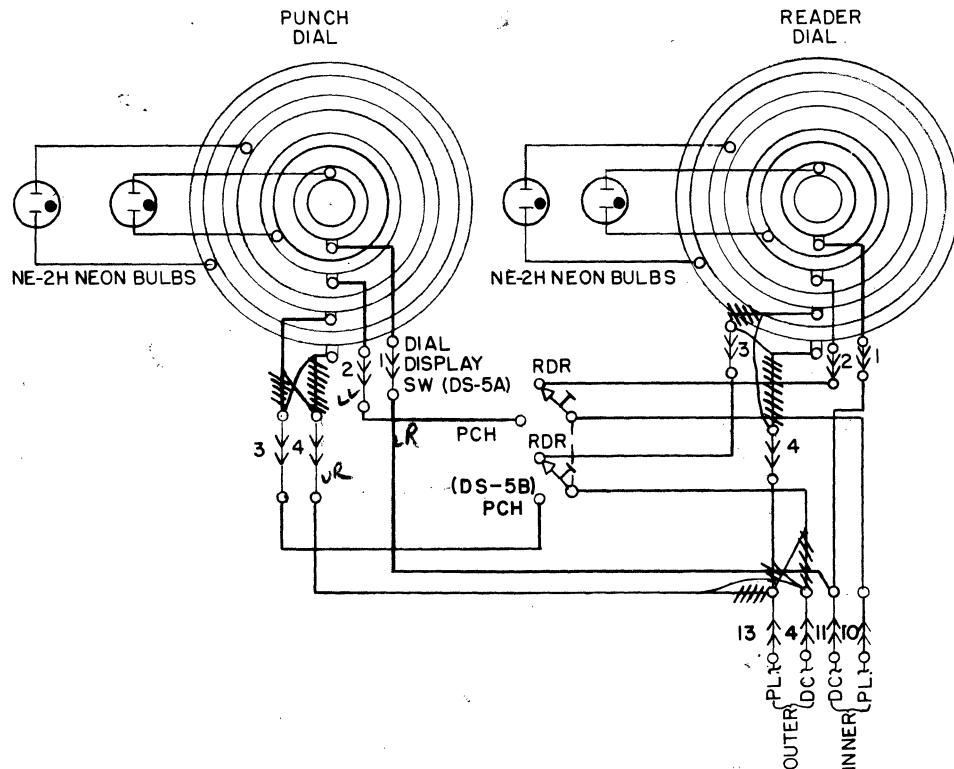
4-21-60 801375-R
 5-31-60 801424F
 7-11-60 801424S
 9-19-60 801765
 12-28-60 801906C



605443

DISCONTINUED

SECTION 15A C-L SUFFIX

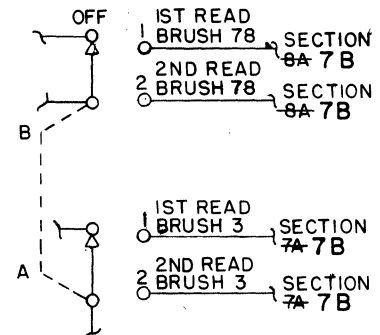


SECTION 15B C-L SUFFIX

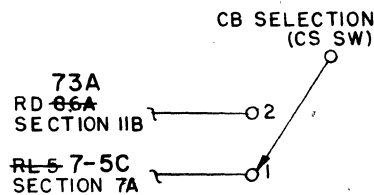
CAM DISPLAY

2 LATCH RESET RD PCH STACK CL

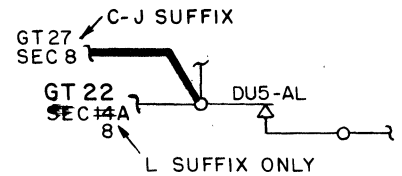
SECTION 16A & B C-L SUFFIX



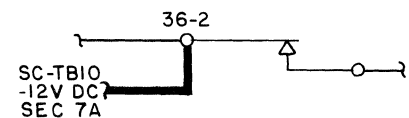
SECTION 16A C-L SUFFIX



SECTION 17B



SECTION 17B C-L SUFFIX

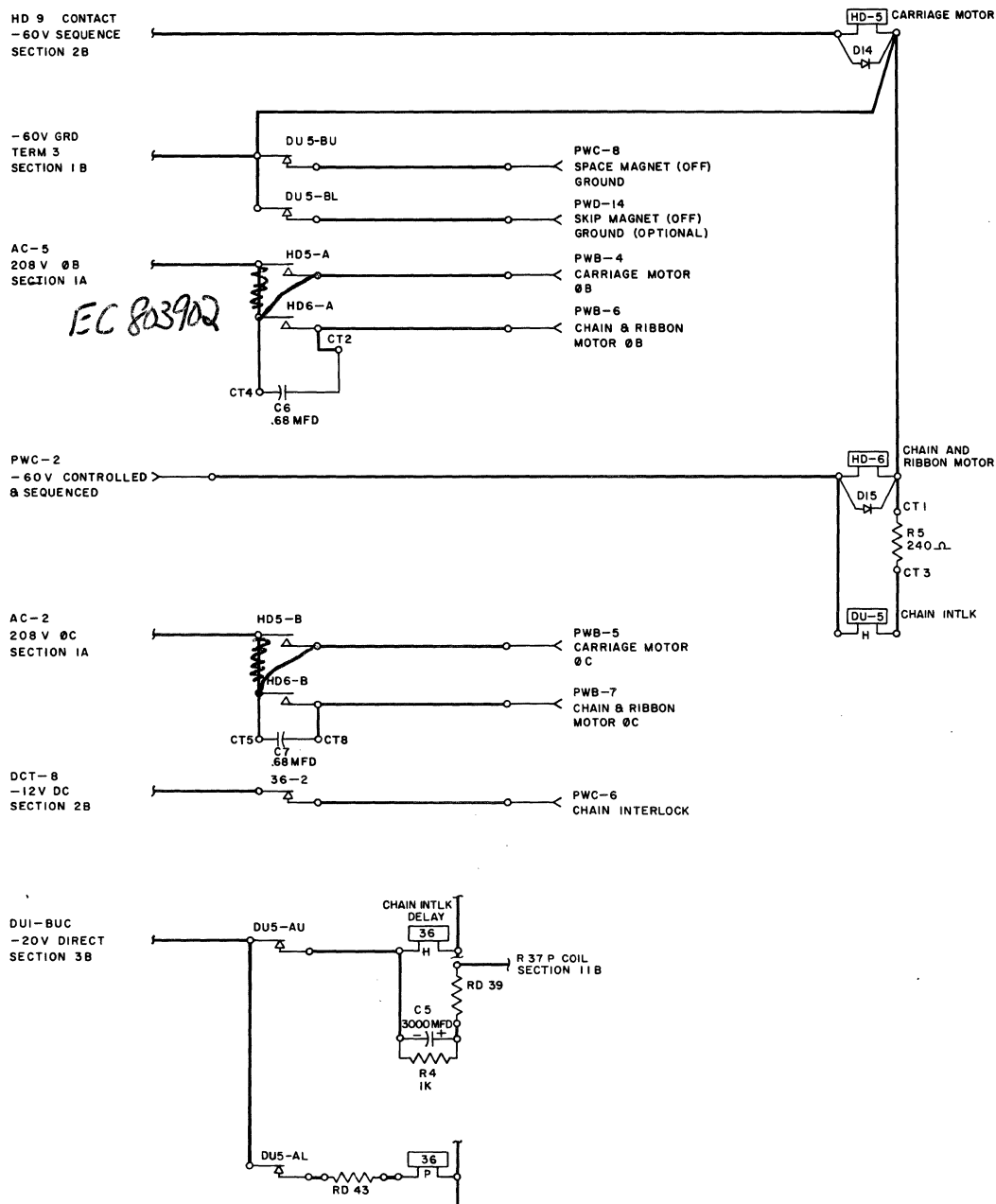


INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.	INSTRUCTION
NAME	SOLAR CB WIRING			7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 894924		
DIAGRAM CHANGES										
DESIGN	88B	5-3-62	MODEL	1402-1						
DETAIL	88B	7-6-62						USED IN 605366		
CHECK	HCK	7-6-62	DRAW							
APPRO	ELS	7-11-62	CHECK						605443	

INSTRUCTION

CHANGE NO
800972Q
801424G
801906C

21.00.11.1



SWITCH LOCATIONS

CHANGE NO
800972 Q
801755
801906 C

COVER INTERLOCKS

PUNCH	3 B
TRANSPORT	
RIGHT FRONT	
RIGHT SIDE	
LEFT REAR	
LEFT SIDE	
LEFT FRONT	
RIGHT REAR	↓

PUNCH INTERLOCKS

MAGAZINE	9 B
DIE LIFT	10 B
CRANK	10 B
DIE	10 B

MISCELLANEOUS SWITCHES

STACKER	3 B
JAM BAR	3 B
JOGGLE	4 B
CHIPS 1 & 2	9 B

CONTROL KEY AND LIGHT PANEL

LIGHTS	LOC	SWITCHES	LOC
PUNCH CHECK	5 B	PUNCH ON OFF	9 B
PUNCH STOP	11 A	PUNCH N PRO	9 B, 11 A
FUSE	4 A	START KEY	5 A, 5 B
CHIPS	10 B	CHECK RESET KEY	5 B
STACKER	4 B	STOP KEY	3 B, 6 B
POWER	5 B	LOAD KEY	4 B, 5 A
TRANSPORT	4 B	READ N PRO	4 B, 5 A, 4 B
VALIDITY	5 B	READER ON OFF	3 B
READER CHECK	5 B		
READER STOP	5 A		

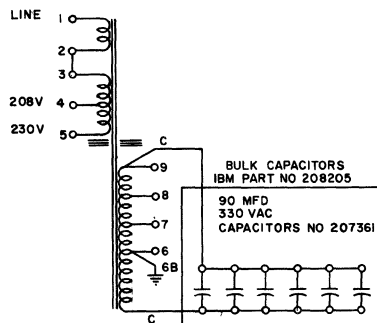
VOLTAGE TEST-HUBS

+6	2 B
-12	2 A
-20	2 A
-60	1 B
GND	2 B

SERVICE SWITCHES

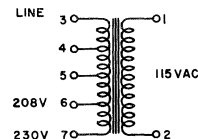
NAME	TYPE	CIRCUITS	LOCATION	USE
DS-1	* MC	2	7 A	READ BRUSH DISPLAY
DS-2	MC	1	13 A	PUNCH BRUSH DISPLAY
DS-3	MC	2	16 B	READ CAM DISPLAY
DS-4	MC	2	16 B	PUNCH CAM DISPLAY
PC	MC	1	11 A	PUNCH CLUTCH TRIP
RC	MC	1	5 A	READ CLUTCH TRIP
DS-5	TOGGLE	2	15 A	DIAL SELECTION (READ OR PUNCH)
TIMER	TOGGLE	2	15 A	POWER ON TIMER
CS	ROTARY	1-11 POS	16 A	CAM SELECTION
BS	ROTARY	2-5 POS	16 A, 16 B	BRUSH SELECTION
CT	ROTARY	6-2 POS	5 A, 6 A, 11 A, 12 A	OFF LINE CARD FEED
SYNC	MC	1	11 A	SYNCS PUNCH CLUTCH PULSES
RS	TOGGLE	2	5 B, 3 B	OVER RIDE INTERLOCK SWITCH

* MOMENTARY CONTACT

CIRCUIT DIAGRAM
1250W BULK SUPPLY
FERRO RESON
IBM PART NO 208274

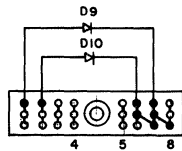
TRANSFORMER CONNECTIONS

PRIMARY CONNECTIONS
TERMINALS 1-4 208VAC
TERMINALS 1-5 230VAC
JUMPER 2 TO 3
OUTPUT CONNECTIONS TERMINALS 6 & 8 130V
SECONDARY TAPS 7 AND 9
PROVIDE APPROXIMATELY
±1.5% ADJUSTMENT

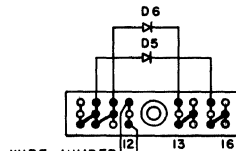
CIRCUIT DIAGRAM
115 VAC, 15A TRANSFORMER
IBM PART NO 209000

PRIMARY CONNECTIONS
TERMINALS 3-6 208 VAC
TERMINALS 3-7 230 VAC

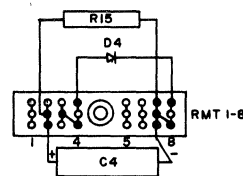
PKT LOCATION	
1	12 B
2	12 B
3	-
4	-
5	-
6	12 B
7	12 B
8	12 B
9	5 B
10	-
11	-
12	-
13	-
14	-
15	-
16	5 B



POCKET TERMINALS (PKT)
(LOCATED ON FRONT SIDE FRAME)



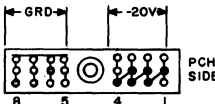
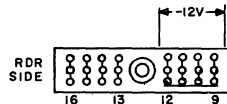
WIRE JUMPER
PKT 9 TO 16
(RDR SIDE)



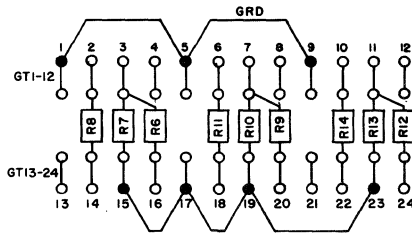
READ CLUTCH MAGNET TERMINALS
(LOCATED ON REAR SIDE FRAME)

RMT LOCATION	
1	-
2	6 A
3	5 A
4	5 A
5	-
6	-
7	5 A
8	5 A

CST LOCATION	
1	5 A
2	5 A
3	5 A
4	5 A
5	6 B
6	4 B
7	4 A
8	4 B
9	5 B
10	5 B
11	5 B
12	5 B
13	-
14	-
15	-
16	-



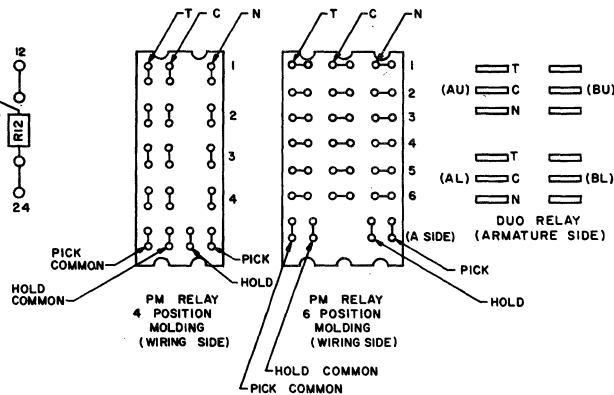
CONSOLE TERMINALS (CST 1-16)



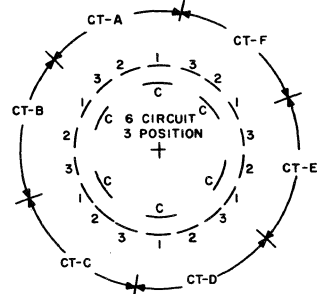
GATE TERMINALS (GT)
(LOCATED ON RELAY GATE)

GT LOCATION							
1	8A	9	14A	17	2B		
2	8A	10	14A	18	8A		
3	8A	11	14A	19	8A		
4	-	12	-	20	8A		
5	8B	13	-	21	-		
6	8A	14	8A	22	14A		
7	8B	15	8A	23	14A		
8	-	16	8A	24	14A		

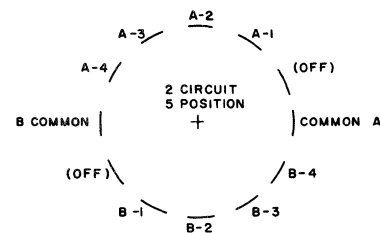
PERMISSIVE MAKE RELAY				COIL		
TYPE	SIZE	PART NO	DESCRIPTION	NO	RESISTANCE	
					PICK	HOLD
1	FOUR	719003	HIGH SPEED	719009	70±7Ω	700±70Ω
2	SIX	719007	STANDARD	719011	105±15.5Ω	600±60Ω
3	FOUR	719005	STANDARD	719010	126±12.6Ω	700±70Ω



SEE METER
B/M SHEET #
635059 FOR
SWITCH LAYOUT

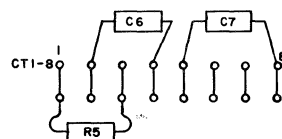


CONTROL TRANSFER SWITCH (CT)
(OFF LINE CARD FEED)
(ON SERVICE PANEL)
(REAR VIEW)



BRUSH SELECTION SWITCH (BS)
(ON SERVICE PANEL)
(REAR VIEW)

SEE SEC 19 & 20 B FOR
CIRCUIT LOCATIONS



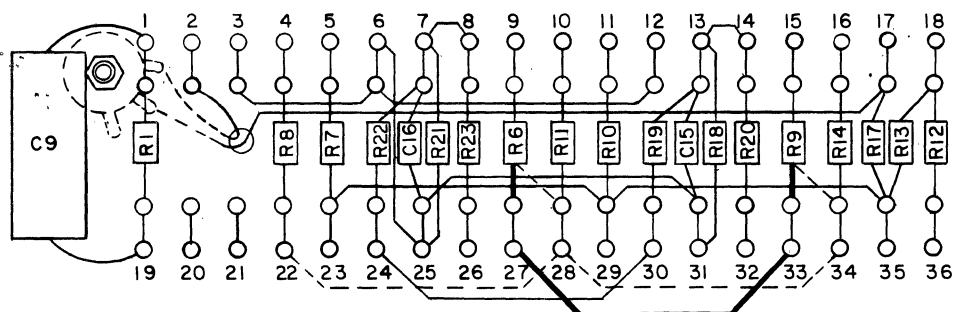
CONTACTOR PANEL
TERMINALS (CT 1-8)

CT LOCATION	
1	18A
2	17A
3	18B
4	17A
5	17B
6	-
7	-
8	17B

SECTION 21 & 22 C-L SUFFIX

605445

DISCONTINUED

GATE TERMINALS (GT)
(LOCATED ON RELAY GATE)

--- DOTTED WIRING FOR
L SUFFIX OR C-J SUFFIX
WITH B/M'S 605290
605291, 605292 OR
605293 (CARBON ROLLS
WITHOUT HALF WRITE)
— HEAVY SOLID WIRING
FOR C-J SUFFIX WITH
HALF WRITE

GT LOCATION									
1	11B	9	8A	17	14A	25	8B	33	8B *
2	7A	10	8A	18	14A	26	8A *	34	8B
3	8B	11	8B	19	12B	27	8A	35	14A
4	8A	12	14A	20	—	28	8A	36	14A
5	8A	13	8B	21	—	29	8B		
6	8B	14	8B	22	8A	30	8B		
7	8A	15	8B	23	8B	31	8B		
8	8A	16	8B	24	8B	32	8B		

* C-J SUFFIX (WITH HALF WRITE)

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME SOLAR CB WIRING				7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 894924	
DIAGRAM ADDITION									
DESIGN	188	5-3-62	MODEL	1402-1					
DETAIL	188	7-6-62							
CHECK	HCL	7-6-62	DRAW					USED IN	
APPRO	RLS	7-11-62	CHECK					*605366	605445

READER CAM-CLUTCHED (RL)
800 RPM SHAFT



CAM LOCATIONS

 CHANGE NO
 802620B
 802928
 802843A

 READER CAMS
 CONTINUOUS RUNNING (RC)-1 1/16" DIA 800 RPM

POS	LOC	PART NO	DESCRIPTION		RETURN VOLTS	CAM JUMPER	
			LOBES	DUR		CAM SIDE	
RC 1	3A	609758	3	85°	-20		
RC 2	3B	609758	3	85°	-		
RC 3	3B	609759	3	45°	-		
RC 4	3B	609758	3	85°	-20		
RC 5	5A	602114	1	70°	-		
RC 6	5B	609760	3	70°	-		
RC 7	3A	609761	3	35°	-		
RC 8	3A	609758	3	85°	-20		
RC 9	4A	609760	3	70°	-		
RC 10							
RC 11							
RC 12	4A	609761	3	35°	--		
RC 13							
RC 14							
RC 15							
RC 16							
RC 17							
RC 18							
RC 19							
RC 20							

CLUTCHED CAMS (RL)-1 1/16" DIA 800 RPM

POS	LOC	PART NO	DESCRIPTION		RETURN VOLTS	CAM JUMPER	
			LOBES	DUR		CAM SIDE	
RL 1	3A	609326	2	30/65°	-20		
RL 2	3A	602122	1	190°	-20		
RL 3	3A	602118	1	122°	-20		
RL 4	7A	602132	6	16°	-		
RL 5	7A	602132	6	16°	-		
RL 6	7A	602132	6	16°	-20		
RL 7	7A	602132	6	16°	-		
RL 8	7A	602132	6	16°	-20		
RL 9	7A	602132	6	16°	-		
RL 10	5B	602114	1	70°	-20		

NOTE X

 RL CAMS 4 THROUGH 9 REMOVED ON "M" SUFFIX MACHINES.
 REPLACED BY SOLAR EMITTER

 PUNCH CAMS
 CONTINUOUS RUNNING (PC)-2" DIA 250 RPM

POS	LOC	PART NO	DESCRIPTION		RETURN VOLTS	CAM JUMPER	
			LOBES	DUR		CAM SIDE	
PC 1	9B	255425	4	25°	-		
PC 2	9B	255472	4	72°	-20		
PC 3	11A	255430	4	30°	-		
PC 4	11A	255030	1	30°	-		
PC 5	11A	255430	4	30°	-		
PC 6	11B	255440	4	40°	-20		
PC 7	11B	255430	4	30°	-20		
PC 8							
PC 9							
PC 10							

CONTINUOUS RUNNING (PA)-1" DIA 1333 1/3 RPM

POS	LOC	PART NO	DESCRIPTION		RETURN VOLTS	CAM JUMPER	
			LOBES	DUR		CAM SIDE	
PA 1	13A	609029	3	25°	-		
PA 2	13A	609029	3	25°	-		
PA 3	13A	609029	3	25°	-		
PA 4	13A	609029	3	25°	-		
PA 5	14B	607592	3	70°	-		
PA 6	14B	607592	3	70°	-		
PA 7	14B	607592	3	70°	-20		
PA 8	14B	607592	3	70°	-20		
PA 9	13A	609029	3	25°	-		
PA 10	13A	609029	3	25°	-		
PA 11	13A	609029	3	25°	-		
PA 12	13A	609029	3	25°	-		
PA 13	13A	609029	3	25°	-		
PA 14	13A	609029	3	25°	-		

CLUTCHED CAMS (PL)-1 1/16" DIA-250 RPM

POS	LOC	PART NO	DESCRIPTION		RETURN VOLTS	CAM JUMPER	
			LOBES	DUR		CAM SIDE	
PL 1	9A	607114	1	30°	-20		
PL 2	9A	602129	1	340°	-20		
PL 3	9A	607114	1	30°	-20		
PL 4	9A	602129	1	340°	-20		
PL 5	9B	602128	1	320°	-		
PL 6	11A	607114	1	30°	-20		
PL 7	11A	607730	1	20°	-20		
PL 8	12A	607114	1	30°	-		
PL 9	13A	608607	1	270°	-		
PL 10	13A	608607	1	270°	-		
PL 11	13A	607730	1	20°	-		
PL 12	11B	607730	1	20°	-20		
PL 13	11B	607114	1	30°	-20		
PL 14	11B	602129	1	340°	-20		
PL 15	11B	602119	1	134°	-20		
PL 16	13A	607730	1	20°	-20		
PL 17							
PL 18							
PL 19							
PL 20							

SECTION 25 AND 26 C-L SUFFIX
DISCONTINUED CLUTCHED CAMS (RL)-1 1/16" DIA 800 RPM

INSTRUCTIONS

605446

POS	LOC	PART NO	DESCRIPTION		RETURN VOLTS	CAM JUMPER	
			LOBES	DUR		CAM SIDE	
RL1	3A	609326	2	30/65°	-20		
RL2	3A	602128	1	320°	-20		
RL3	3A	602113	1	50°	-20		
RL4	7A	602132	6	16°			
RL5	7A	602132	6	16°			
RL6	7A	602132	6	16°	-20		
RL7	7A	602132	6	16°			
RL8	7A	602132	6	16°	20		
RL9	7A	602132	6	16°			
RL10							

SECTION 29 AND 30 C-L SUFFIX
CB SELECTOR SWITCHES (REFERENCE ONLY)

0	30	60	90	120	150	180	210	240	270	300	330	0	POS	LOC
1													1	7A
2													2	7A IIB
3													3	5A
4													4	5B
5													5	4A
6													6	4A
7													7	11A
8													8	11B
9													9	11B
10													10	12B
11													11	14A

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME SOLAR CB WIRING		7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 694924	
DESIGN 15B 5-3-62 MODEL 1402-1						USED IN 605366	
DETAIL 15B 7-6-62							
CHECK 15B 7-6-62 DRAW							
APPRO 15B 7-11-62 CHECK							

INSTRUCTION

TIMING

CHANGE NO

802520B

802928

PUNCH COMPARISON TIMING CHART (REFERENCE ONLY)

250 CPM BASIS -1.57MS																									0		30		60		90		120		150		180		210		240		270		300		330		0		POS		LOCATION		DESCRIPTION	
PA1 PA2 PA3 PA4 PA5 PA6 PA7 PA8 PA9 PA10 PA11 PA12 PA13 PA14																									12		11		0		1		2		3		4		5		6		7		8		9		10		POS		LOCATION		DESCRIPTION	
PA1		18.2		40.7		63.2		85.7		108.2		130.7		153.2		175.7		198.2		220.7		243.2		265.7		288.2		310.7		333.2		355.7		PA1		13A		PUNCH SCAN MAKE																		
PA2		18.2		40.7		63.2		85.7		108.2		130.7		153.2		175.7		198.2		220.7		243.2		265.7		288.2		310.7		333.2		355.7		PA2		13A		PUNCH SCAN MAKE																		
PA3 AND PA11		107		332		557		782		1007		1232		1457		1682		1907		2132		2357		2582		2807		3032		3257		3482		PA3		13A		LATCH RESET--MAKE																		
PA4 AND PA12		77		302		527		752		977		1202		1427		1652		1877		2102		2327		2552		2777		3002		3227		3452		PA4		13A		LATCH RESET--BREAK																		
PA5		0		22.5		45		67.5		90		112.5		135		157.5		180		202.5		225		247.5		270		292.5		315		337.5		PA5		14B		PUNCH MAGNET--MAKE																		
PA6		0		22.5		45		67.5		90		112.5		135		157.5		180		202.5		225		247.5		270		292.5		315		337.5		PA6		14B		PUNCH MAGNET--MAKE																		
PA7		21.5		44		66.5		89		111.5		134		156.5		179		201.5		224		246.5		269		291.5		314		336.5		359		PA7		14B		PUNCH MAGNET--BREAK																		
PA8		21.5		44		66.5		89		111.5		134		156.5		179		201.5		224		246.5		269		291.5		314		336.5		359		PA8		14B		PUNCH MAGNET--BREAK																		
PA9 AND PA13		53		278		503		728		953		1178		1403		1628		1853		2078		2303		2528		2753		2978		3203		3428		PA9		13A		BRUSH IMPULSE--MAKE																		
PA10 AND PA14		21		24.6		47.1		69.6		92.1		114.6		137.1		159.6		182.1		204.6		227.1		249.6		272.1		294.6		317.1		339.6		PA10		13A		BRUSH IMPULSE--BREAK																		
PA11		PA11 TIMING SAME AS PA3																									PA11		13A		LATCH RESET - MAKE																									
PA12		PA12 TIMING SAME AS PA4																									PA12		13A		LATCH RESET - BREAK																									
PA13		PA13 TIMING SAME AS PA9																									PA13		13A		BRUSH IMPULSE - MAKE																									
PA14		PA14 TIMING SAME AS PA10																									PA14		13A		BRUSH IMPULSE - BREAK																									

CB SELECTOR SWITCHES (REFERENCE ONLY)

0	30	60	90	120	150	180	210	240	270	300	330	0	POS	LOCATION
1**	12	30	48	66	84	102	120	138	156	174	192	210	1	7A
2**	15	33	51	69	87	105	123	141	159	177	195	213	2	7A
3**	15	33	51	69	87	105	123	141	159	177	195	213	3	5A
4**									272		342		4	5B
5**									242		277		5	4A
6**									242		277		6	4A
7*										296	320		7	11A
8*	35		75										8	11B
9*							180	210					9	11B
10*								215	235				10	12B
11*									257	277			11	14A

SEE INDIVIDUAL CAM TIMING FOR CAM TOLERANCES
 *USE PUNCH SYNC SWITCH FOR CORRECT TIMING
 **USE READ SYNC SWITCH FOR CORRECT TIMING

CHANGE NO
8009720
801755
801765
801902C
801906C
802200

802334

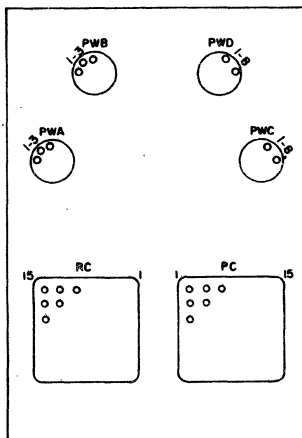
READER CONNECTOR WIRES (RC)

CONNECTOR POS (RC)	WIRE DIAGRAM LOC	LOGIC REF	DESCRIPTION
1 TO 80	7A-8A		COL 1 TO 80-NO 1 READ BRUSH
81 TO 160	7B-8B		COL 1 TO 80-NO 2 READ BRUSH
161	6B	36.19.11.1	START KEY NC(+START KEY NC)
162			
163			
164			
165			
166			
167			
168	4A	36.18.11.1	READ STOP (-T READ STOP)
169	4B	36.10.11.1	LOAD KEY (-T LOAD KEY)
170	6A	36.10.11.1	READ CLUTCH (-T RD CLUTCH)
171	6A	36.10.11.1	PROCESS FEED (-T PROC FEED)
172	6A	36.10.11.1	NOT PROC FEED (-T NOT PROCESS FEED)
173	6B	36.02.11.1	READ JAM (-T RD JAM)
174	6A	36.02.11.1	READ CHECK RESET(+T CHECK RESET RD)
175	6A	36.02.11.1	INTERLOCK STOP (+U INTERLOCK STOP)
176	6B	36.16.11.1	LAST CARD (-T LS CD OUT)
177			
178	3A	36.50.11.1	READ STACKER RESET(+T RD STACKER RESET)
179	6B	36.02.11.1	STOP KEY-ON (-T STOP KEY RP)
180	6B	36.19.11.1	START KEY (+T START KEY RP NO)
181	6B	36.01.31.1	NO 2 CL (-T 2 CL C)
182	6B	36.18.11.1	READ CHECK LIGHT (+U READ CHECK LIGHT)
183	6B	36.18.11.1	INVALID LIGHT (+U INVALID LIGHT)
184	6B	36.50.11.1	RD STACK MAG 1 (+U STACK 1)
185	6B	36.50.11.1	RD STACK MAG 2 (+U STACK 2)
186	4A	36.01.31.1	READ COMPLETE GATE (-T RD COMP GATE)
187	8A	36.12.21.1	BRUSH CB RESET (-T CB RESET)
188	8A	36.12.21.1	BRUSH IMP CB(-T BRUSH IMP CB)
189	8A	Ø1AIG16A	1/2 WRITE-NO 1 BRUSH
190	8A	Ø1AIG16B	1/2 WRITE-NO 2 BRUSH
191			
192	SPARE		
193	SPARE		
194	6B	36.50.11.1	STACK SELECT (-T STACK SELECT)
195			
196			
197			
198			
199			
200			

PUNCH CONNECTOR WIRES (PC)

CONNECTOR POS (PC)	WIRE DIAGRAM LOC	LOGIC REF	DESCRIPTION
1 TO 80	14B	36.29.11.1	COL 1 TO 80 PUNCH MAGNETS (+U)
81 TO 160	13A-14A	36.29.51.1	COL 1 TO 80 PUNCH BRUSHES
161			
162			
163			
164			
165			
166			
167			
168			
169			
170			
171			
172			
173	14A	36.19.11.1	(-U LATCH RESET)
174	14A	36.22.11.1	(-T AFTER 9 CAM)
175	14A	36.21.11.1	(-T PCH SCAN CB)
176	4A	36.18.11.1	(-T PCH STOP)
177	12A	36.24.11.1	(-T PUNCH CLUTCH MAGNET)
178	12A	36.24.11.1	(-T PROCESS PUNCH)
179	12A	36.24.11.1	(-T NOT PROCESS PUNCH)
180	12A	36.25.11.1	(-T PUNCH JAM)
181	12A	36.25.11.1	(+T CHECK RESET PUNCH)
182	12B	36.21.11.1	DIE CL DELAY (-T PD CLD)
183	12B	36.50.11.1	(-T STACKER LATCH RESET)
184	12B	36.50.11.1	STACKER RELAY (+U STACK 4)
185	12B	36.50.11.1	STACKER RELAY (+U STACK 8)
186	SPARE	36.19.11.1	
187	14A	Ø1AIG26A	1/2 WRITE- PUNCH BRUSHES
188			
189	12B	36.50.11.1	STACK INHIBIT (+U STACK INH)
190	6B	36.18.11.1	(+U PUNCH CHECK LIGHT)
191	6B	37.01.11.1	(-T START RELAY)
192			
193			
194			
195			
196	14A	36.21.11.1	(-T LINE BRUSH IMP)
197			
198			
199			
200			

CONNECTOR PANEL



PWA	LOC	FUNCTION
1	2A	BULK SUPPLY
2	-	SPARE
3	2A	BULK SUPPLY
4	1A	TAPE DRIVE
5	1A	TAPE DRIVE
6	1A	AC GROUND
7	1A	TAPE DRIVE
8	-	SPARE

PWC	LOC	FUNCTION
1	2B	CHAIN INTERLOCK
2	17A	CHAIN RELAY PICK
3	2A	-12 VDC
4	2B	-60 V GROUND
5	2B	-60 V GROUND
6	18B	CHAIN INTERLOCK
7	2B	+6 VDC
8	18A	SPACE MAGNETS OFF
9	2A	-20 VDC

POWER CONNECTORS

PWB	LOC	FUNCTION
1	2A	INTERLOCK
2	-	SPARE
3	1A	EMERGENCY STOP
4	18A	CARRIAGE MOTORS
5	18B	CARRIAGE MOTORS
6	18A	CHAIN & RIBBON MOTORS
7	18B	CHAIN & RIBBON MOTORS
8	2A	INTERLOCK
9	-	SPARE
10	-	SPARE
11	1A	POWER ON SWITCH
12	1A	POWER ON SWITCH
13	1A	SYSTEM POWER
14	1A	SYSTEM POWER
15	2B	CONV OUTLET
16	2B	BLOWERS
17	2B	BLOWERS

PWD	LOC	FUNCTION
1	-	SPARE
2	2B	PRINTER MAGNETS
3	2A	MARGINAL CHECK
4	2A	DC GROUND
5	2A	MC CONTROL
6	2A	MARGINAL CHECK
7	2B	PRINTER MAGNETS
8	2A	BUCK BOOST
9	2B	-20 V SENSE CONTROL
10	2B	-12 V SENSE
11	2B	POWER HOLD
12	2B	PRINTER INTERLOCK CONT 1
13	2B	PRINTER INTERLOCK CONT 2
14	18A	SKIP OFF RELAY INTERLOCK
15	2B	SPACE MAGNETS
16	2A	CONTROL
17	2A	BUCK BOOST

DISCONTINUED SECTION 31 AND 32 C-L SUFFIX

READER CONNECTOR WIRES (RC)

CONNECTOR POS (RC)	WIRE DIAGRAM LOC	LOGIC REF	DESCRIPTION
1 TO 80	B B 7* - 8*	42.40.51.1	COL 1 TO 80-NO 1 READ BRUSH
163	8A	36.10.21.2	SOLAR CB 1ST READ
187	8A	36.10.21.2	SC CB 2ND RD BRUSH CB RESET (T CB RESET)
188	8A	36.10.21.2	SC CB 1ST CD BRUSH IMP CB (T BRUSH IMP CB)

POWER CONNECTORS

PWB	LOC	FUNCTION
10	8B	+30V DC

INTERNATIONAL BUSINESS MACHINES CORP.

NAME SOLAR CB WIRING
 DIAGRAM CHANGES
 DESIGN 898 5-3-62 MODEL 1402-1
 DETAIL 898 7-6-62
 CHECK HCK 7-6-62 DRAW
 APPRO RLS 7-11-62 CHECK

DATE

CHANGE NO.

DATE

CHANGE NO.

NOTE

X PRINT TO ENG. SPEC. NO.
 894924

DEVELOPMENT NO.

USED IN
 605366

605447

INSTRUCTION

CHANGE NO
802820B
802928

RESISTORS				
NO	DWG LOC	OHMS	WATTS	PART NO
1	12B	50	5	609522
2	4B	3K	10	253870
3				
4	17B	1K	1/2	213693
5	18B	240	2	609399
6	8A	30	10	609423
7	8A	120	2	609422
8				
9	8A	30	10	609423
10	8A	120	2	609422
11				
12	14A	30	10	609423
13	14A	120	2	609422
14				
15	5A	75	5	337627
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

DIODES			
NO	DWG LOC	PART NO	PHYSICAL LOCATION
1			
2	2B	599917	HDS - CONTROL PANEL
3	4B	609397	HDI COIL - CONT PANEL
4	5A	609414	RD CLU MAGNET COIL
5	5B	609414	RD STACK MAG COIL
6	5B	609414	RD STACK MAG COIL
7	10B	609397	HD2 COIL - CONT PANEL
8	12A	609397	PCH CLU MAGNET COIL
9	12B	609414	PCH STACK MAG COIL
10	12B	609414	PCH STACK MAG COIL
11			
12			
13			
14	18A	609397	HD5 COIL - CONT PANEL
15	18A	609397	HD6 COIL - CONT PANEL
16	2B	609397	HD4 COIL - CONT PANEL
17			
18			
19	14B	441318	RELAY GATE
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

ON RELAY GATE				
POS	LOC	OHMS	WATTS	PART NO *
1				
2	6B	130	1	B
3	4A			A
4	4B			802175
5	4B			802175
6	4A	130	1	B
7	6B	130	1	B
8	4A	1K	1	315970
9	12A			A
10	12A			805231
11	4B			802175
12	11A	1/2MFD	CAPAC	609746
13	4A			A
14	8A	130	1	B
15	12B	130	1	B
16				
17	6B	130	1	B
18	10A	150	2	719343
19	4A			802175
20	6A	130	1	B
21	4A			802175
22	12A	130	1	B
23	12A	130	1	B
24	4B			802175
25	4A			A
26	4A			A
27	6A	130	1	B
28	6A			802175
29				
30				
31	10B			A
32	5A	390	1	2114246
33	6A			A
34	10B	150	2	719343
35	5B	47	1	471804
36	5A	680	1/2	2103073
37	4B			A
38	4B			A
39	17B	10	1	609417
40	4B	22	2	471803
41	4B	150	2	719343
42	4B	10	1	609417
43	17B	150	2	719343
44	4B	130	1	B
45	4B			A
46	3A			802175
47	3B			802175
48	3B	240	1	609416
49	6A			805231

* - PART NUMBER
A - 441318 - DIODE ASM
B - 609415 - RESISTOR ASM

ON RELAY GATE				
POS	LOC	OHMS	WATTS	PART NO *
50	5A	1/2MFD	CAPAC	609746
51	5A			A
52	4A			A
53	12B			A
54	14A	130	1	B
55	11B			A
56	4A			802175
57	4A			802175
58	3A			A
59				
60	3A			802175
61	4A	240	1	609416
62	4A	130	1	B
63	14A	130	1	B
64	3B			802175
65	4B	130	1	B
66	3B	240	1	609416
67				
68	14A	130	1	B
69	5B	130	1	B
70	14A	130	1	B
71	6A			A
72	14A	130	1	B
73	11B			A
74	10A			A
75				
76	10A			A
77	6B			A
78	9A			A
79	3A	130	1	B
80	12A	130	1	B
81	6B			A
82	10B	240	1	609416
83	5A	680	1/2	2103073
84	11A	680	1/2	2103073
85	12B	130	1	B
86	7A			609396
87	7A			609396
88	8A	130	1	B
89	10B	1/2MFD	CAPAC	A
90	10B	1/2MFD	CAPAC	A
91	10B	10	1	609417
92	11B			A
93	11B			A
94	11A	390	1	2114246
95	10B			802175
96	10B			A

TERMINAL BLOCK LOCATION TB-60

1	4A			A
2				
3	4A			A

CAPACITORS					
NO	DWG LOC	MFD	VOLTS	PART NO	PHYSICAL LOCATION
1	4B	7500	25 DC	524669	RELAY GATE
2	4B	1000	25 DC	609395	RELAY GATE
3	10B	500	25 DC	609704	RELAY GATE
4	5A	500	25 DC	609490	RD CLU MAG
5	17B	3000	25 DC	609390	RELAY GATE
6	17A	.68	600 DC	609081	CONTACTOR PNL
7	17B	.68	600 DC	609081	CONTACTOR PNL
8	2B	.22	600 DC	609623	HD-9 COIL
9	12B	500	25 DC	609704	RELAY GATE
10	14B	.47	100 DC	609746	RELAY GATE
11	14B	.47	100 DC	609746	RELAY GATE
12	14B	.47	100 DC	609746	RELAY GATE
13	5A	.47	100 DC	609746	RELAY GATE

DISCONTINUED

SECTION 33 AND 34 C-L SUFFIX

605448

RESISTORS

NO	DWG LOC	OHMS	WATTS	PART NO	PHYSICAL LOCATION
6	8A	24 30	5 10	610367 609423	RELAY GATE
7	8B 8A	110 120	1 2	610369 609422	RELAY GATE
9	8B 8A	24 30	5 10	609367 609423	RELAY GATE
10	8B 8A	110 120	1 2	610369 609422	RELAY GATE
12	14A	24 30	5 10	610367 609423	RELAY GATE
13	14A	110 120	1 2	610369 609422	RELAY GATE
14	8B 14A	110	2	609393	RELAY GATE
16	7A	10	4	610373	RELAY GATE
17	14A	10	5	603212	RELAY GATE
18	8B	9.1K	1/2	610372	RELAY GATE
19	8B	9.1K	1/2	610372	RELAY GATE
20	8B	160	1/2	317580	RELAY GATE
21	8A	9.1K	1/2	610372	RELAY GATE
22	8A	9.1K	1/2	610372	RELAY GATE
23	8A	160	1/2	317580	RELAY GATE
24	7A	20K	1/2	300723	READ FEED
25	7A	110K	1/2	317033	READ FEED
26	7A	6.8K	1/2	317025	READ FEED
27	7A	20K	1/2	300723	READ FEED
28	7A	1.3K	1/2	317429	READ FEED
29	7A	3K	1/2	334959	READ FEED
30	7A	1K	1	315970	RELAY GATE

CAPACITORS

NO	DWG LOC	MFD	VOLTS	PART NO	PHYSICAL LOCATION
15	8B	.33	100DC	610368	RELAY GATE
16	8A	.33	100DC	610368	RELAY GATE

DIODES

NO	DWG LOC	PART NO	PHYSICAL LOCATION
11	7A	603793	RELAY GATE

ON RELAY GATE

RESISTOR DIODES (RD1-48)

POS	LOC	OHMS	WATTS	PART NO
14	8A	130	1	8

ON RELAY GATE

RESISTOR DIODES (49-96)

POS	LOC	OHMS	WATTS	PART NO
86	8A			609396
87	7A			609396
88	8A	130	1	8

INTERNATIONAL BUSINESS MACHINES CORP.

NAME SOLAR CB WIRING
DIAGRAM ADDITION

DESIGN 1-6 53-62 MODEL 1402-1

DETAIL 2-6 7-6-62

CHECK HKK 7-6-62 DRAW

APPRO RLS 7-11-62 CHECK

DATE

7-20-62

CHANGE NO.

802843K

DATE

11-13-62

804340

CHANGE NO.

NOTE

X PRINT TO ENG. SPEC. NO.
894924

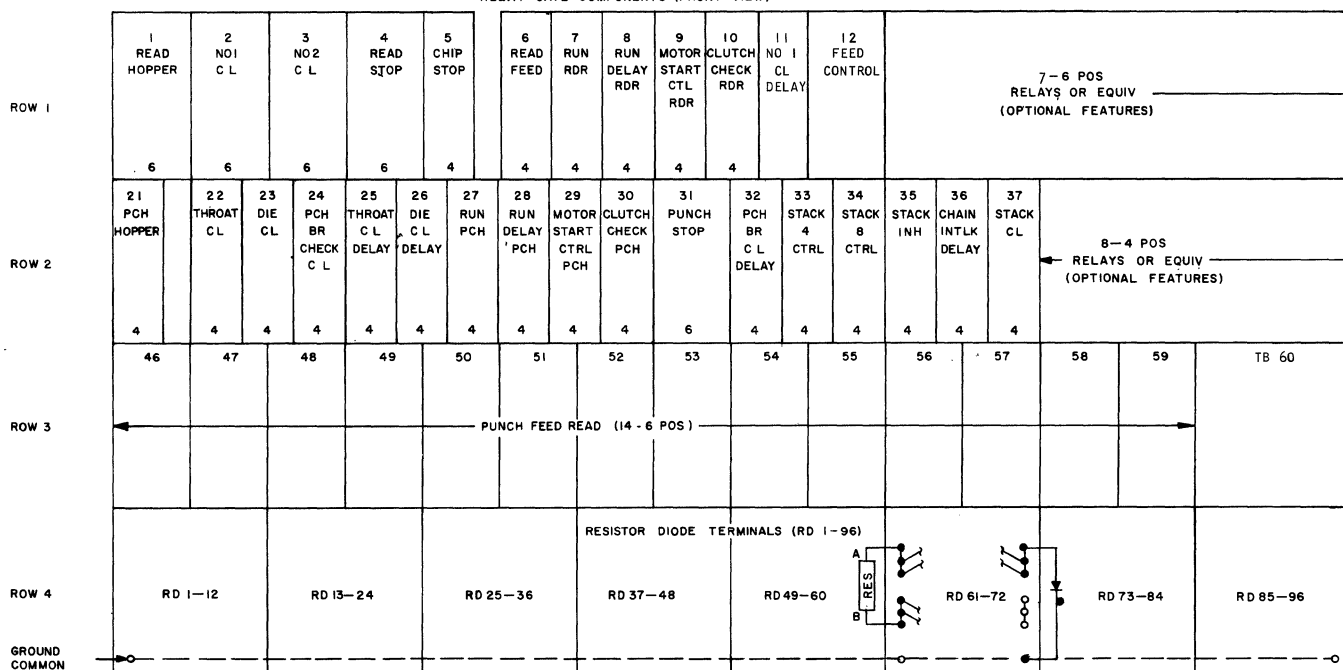
DEVELOPMENT NO.

USED IN
605366

605448

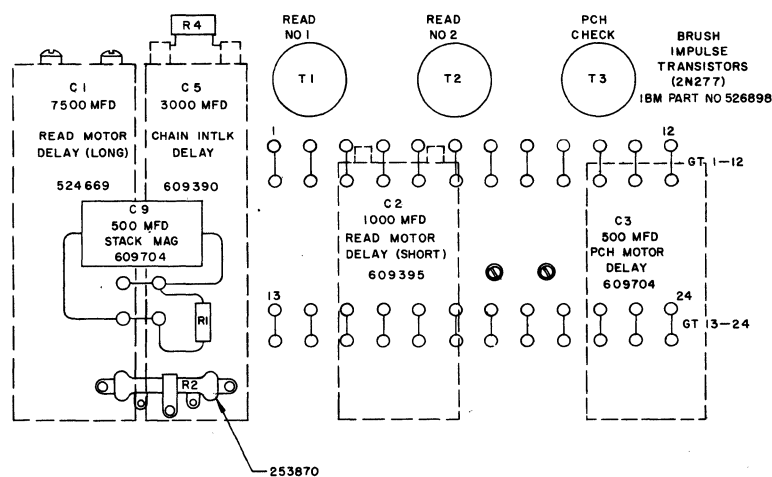
33A-34A

RELAY GATE COMPONENTS (FRONT VIEW)



DUO RELAYS

(DU1)	(DU2)	(DU3)	(DU4)	(DU5)
FUSE (20V)	START (20V)	INTLK STOP (20V)	CHECK RESET (20V)	CHAIN INTLK
609149	609149	609149	609149	124843

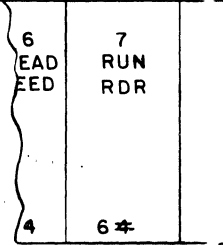


DISCONTINUED

SECTION 35 AND 36 C-L SUFFIX

605449

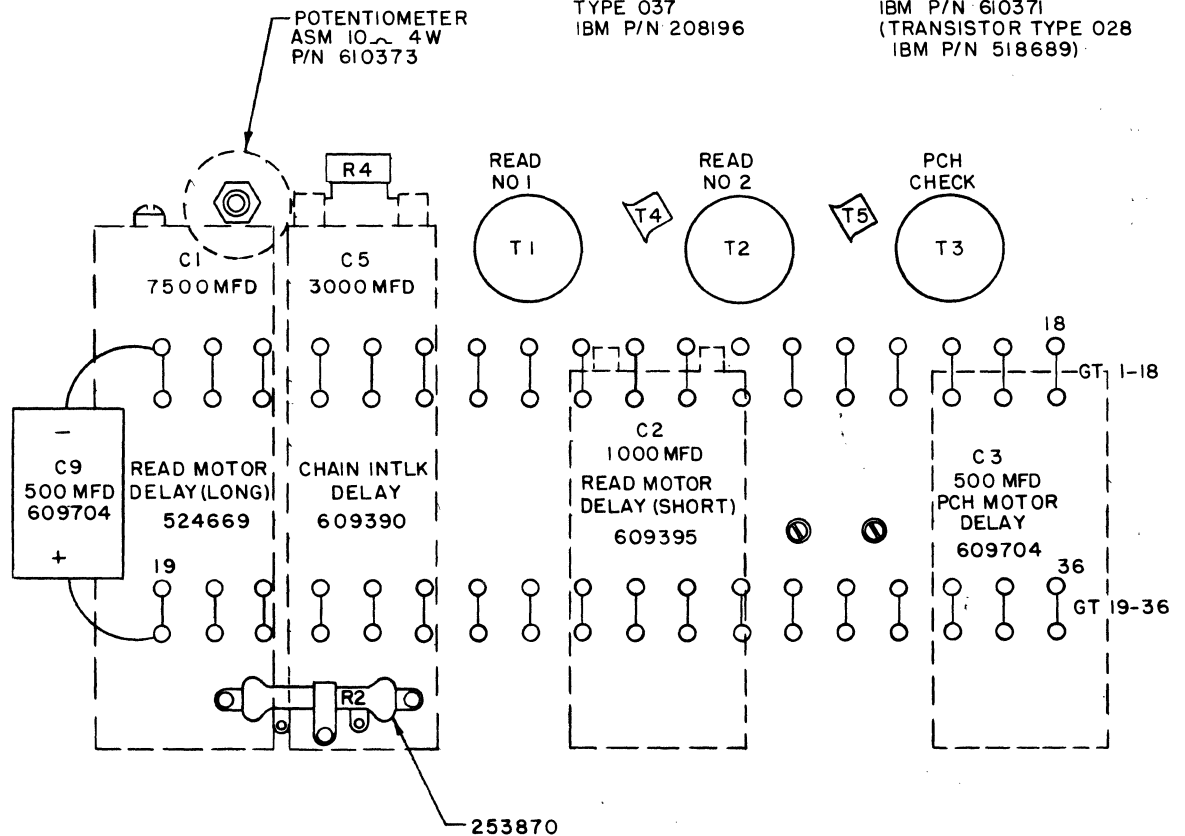
RELAY GATE COMPONENTS (FRONT VIEW)



ROW 1

T1, T2, T3
BRUSH IMPULSE
TRANSISTORS
TYPE 037
IBM P/N 208196

T4, T5
DRIVER TRANSISTOR
WITH INS. LEADS
IBM P/N 610371
(TRANSISTOR TYPE 028
IBM P/N 518689)



INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	SOLAR CB WIRING DIAGRAM ADDITION			7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN	5-3-62	MODEL	1402-1						
DETAIL	7-6-62							USED IN 605366	
CHECK	7-6-62	DRAW							
APPRO	7-11-62	CHECK							605449

35A-36A

RELAY LOCATIONS

LOC	OHMS	TOLERANCE	PART NO	DESCRIPTION
5A	3.3	±0.2	609005	READ CLUTCH MAGNET COIL
12A	11.0	±0.5	609073	PUNCH CLUTCH MAGNET COIL

CHANGE NO
802620B
802928
802843A

HEAVY DUTY RELAYS

RELAY	COIL	CONTA	CONT B			PART NO	DESCRIPTION
HD 1	4B	1B	-			609154	READ MOTOR
HD 2	10B	1B	-			609154	PUNCH MOTOR
HD 3	2B	2A	-			76725	-12V SENSE
HD 4	2B	1A	-			76725	POWER HOLD
HD 5	18A	17A	17B			223642	CARRIAGE MOTOR
HD 6	18A	17A	17B			223642	CHAIN AND RIBBON MOTOR
HD 8	1A	1A	-			480443	CONVENIENCE OUTLET
HD 9	2B	2B	-			369244	PRINTER INTLK CONTROL

DUO RELAYS

RELAY	COILS		CONTACT POINTS				PART NO	DESCRIPTION
	P	H	AU	BU	AL	BL		
DU 1	4A	-	3A	3B	3A	3B	609149	FUSE
DU 2	6A	-	4B	9B			609149	START
DU 3	6A	-	3B	9B			609149	INTLK STOP
DU 4	6B	-	6A	5A	11A	12A	609149	CHECK RESET
DU 5	18B	-	17B	17A	17B	17A	124843	CHAIN INTLK

PM RELAYS

RELAY	COILS		CONTACT POINTS						DESCRIPTION	SIZE	TYPE
	P	H	1	2	3	4	5	6			
1	4A	4A	3B	4B	4B	5A	5B	5A	READ HOPPER C L	6	2
2	4A	4A	4A	4B	5A	5A	8A	5B	NO 1 C L	6	2
3	4A	4A	4A	4B	6A	6A	8A	5B	NO 2 C L	6	2
4	4A	5A	5A	6A	5B	7A	4B	5B	READ STOP	6	2
5	10B		10B	11B					CHIP STOP	4	3
6	4A	6A	5A	4B	5A	5B			READ FEED	4	1
7	4B	4B	4B	5A	5B	5A			RUN-READER	4	1
8	4B	4B	4B	4B					RUN-DELAY-READ	4	3
9	4B	4B	4B	4B	4B	4B			MOTOR CTRL-RDR	4	3
10	5A	4A	4A	4A	4B				READ CLUTCH CHECK	4	1
11	4A	4A	4A	6A	6A				NO 1 CLUTCH DELAY	4	1
12	4A		4A	3A	3A	4A	4A		FEED CONTROL	6	2
13	4A	6A	6A	5A	4A						
14											
15											
16											
17											
18											
19											
20											
21	10A	10A	9B	11A	11B	9B			PUNCH HOPPER C L	4	1
22	10A	10A	10A	9A	11A				THROAT C L	4	1
23	10A	10A	10A	9A	11A				DIE C L	4	1
24	10A	10A	10A	9A	11A	11B			PUNCH BR C L	4	1
25	10A	10A	9A		11A	12A			THROAT C L DELAY	4	1
26	10A	10A	9A	12A	11B	11A			DIE C L DELAY	4	1
27	10B	10B	9B	11A	5B	11A			RUN-PUNCH	4	1
28	10B		10B	10B	5B				RUN DELAY-PUNCH	4	4
29	10B	10B	9B	9B	10B				MOTOR START	4	3
30	12A	10B	10B	11A	9B	12A			PUNCH CLUTCH CHECK	4	1
31	12A	11A	11A	9B	12A	11A	14A	13A	PUNCH STOP	6	2
32	10A	10B	9B	11A	14A	11A			PUNCH BR C L DELAY	4	1
33	11B	12B	11B	12B					STACK 4 CTRL	4	1
34	11B	12B	11B	12B	12B				STACK 8 CTRL	4	1
35	12B	11B	11B	11B	11B	11A			STACKER INH	4	1
36	17B	17B		17B	2B				CHAIN INTLK DELAY	4	3
37	11B		11B	11A	11B				STACKER C L	4	1
38											
39											
40											

DISCONTINUED

SECTION 37 AND 38

C-L SUFFIX

605450

PM RELAYS

RELAY	COILS		CONTACT POINTS						DESCRIPTION	SIZE	TYPE
	P	H	1	2	3	4	5	6			
7							7A		RUN-READER	±6	±2

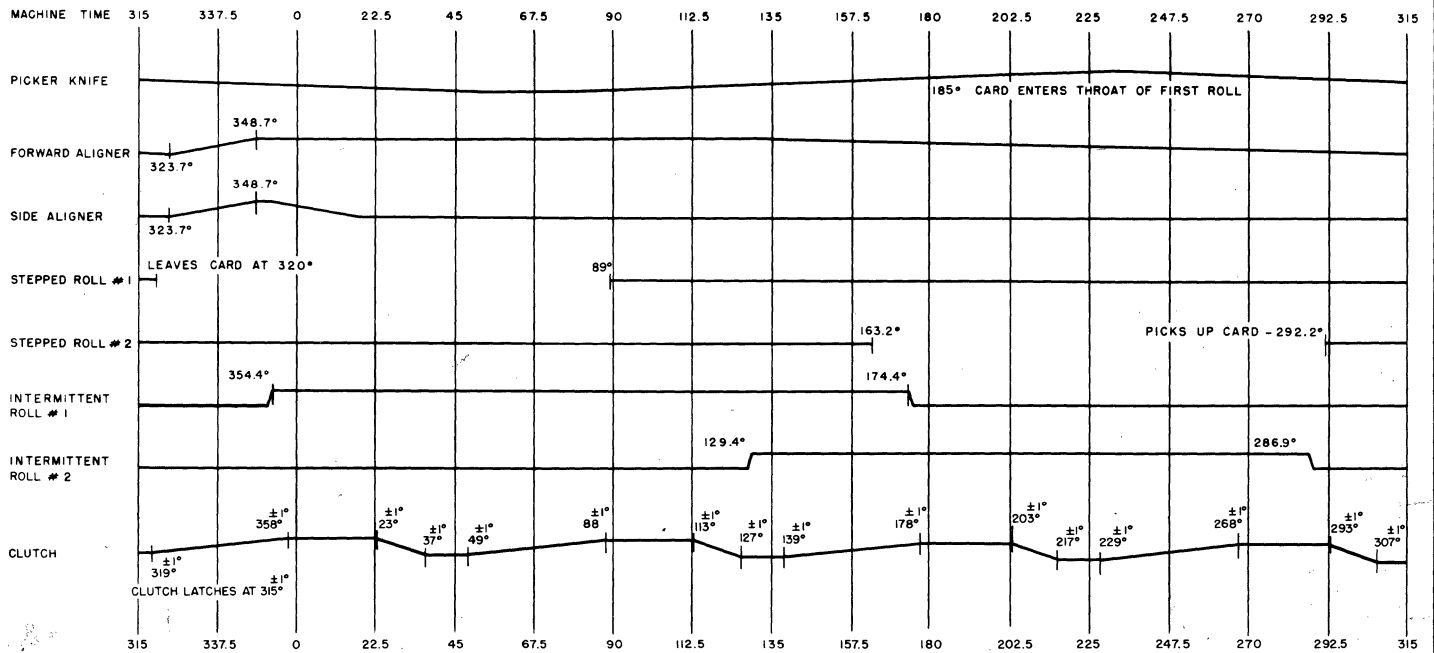
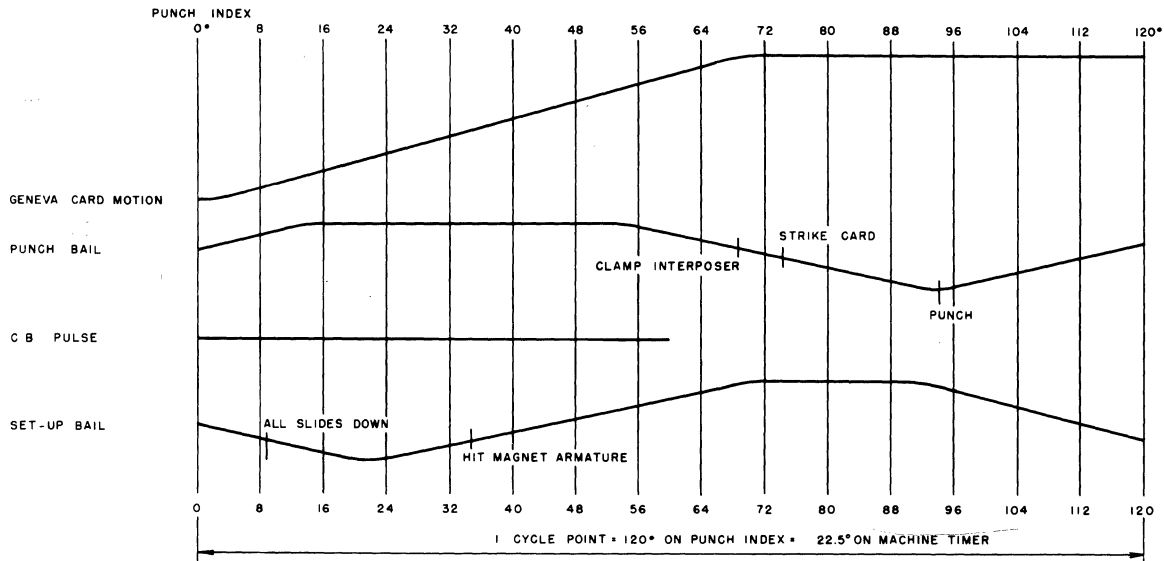
INTERNATIONAL BUSINESS MACHINES CORP.

NAME	DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
SOLAR CB WIRING	7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 894924	
DIAGRAM CHANGES						
DESIGN <i>SPB</i> 5-3-62	MODEL 1402-1					
DETAIL <i>SPB</i> 7-6-62						
CHECK <i>RLS</i> 7-6-62	DRAW					
APPRO <i>RLS</i> 7-11-62	CHECK					
					USED IN 605366	605450

PUNCH MECHANICAL TIMINGS

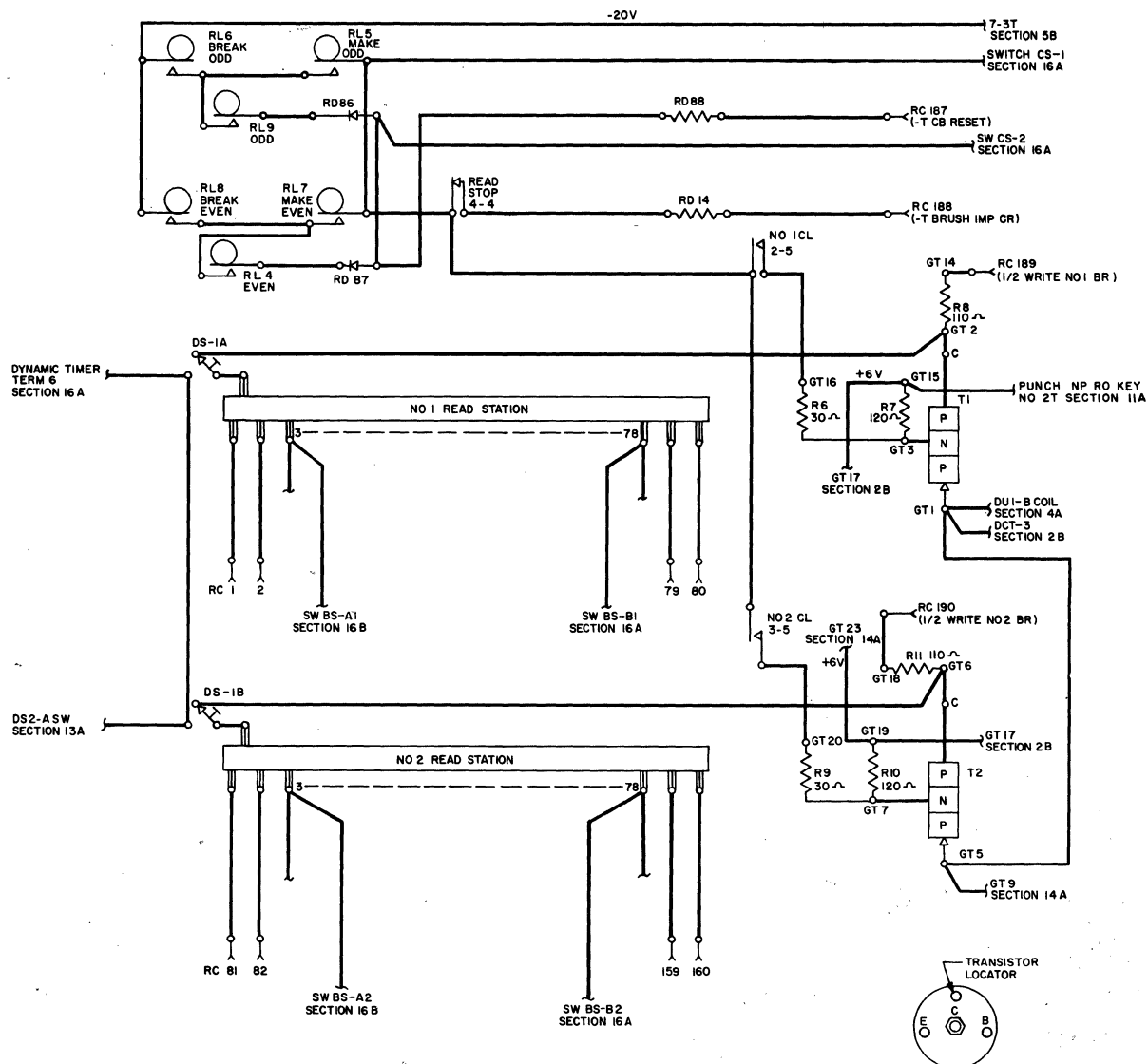
TIMING CHART - 1402
 1333 $\frac{1}{3}$ RPM
 $\frac{1}{3}$ REV = 1 CYCLE POINT

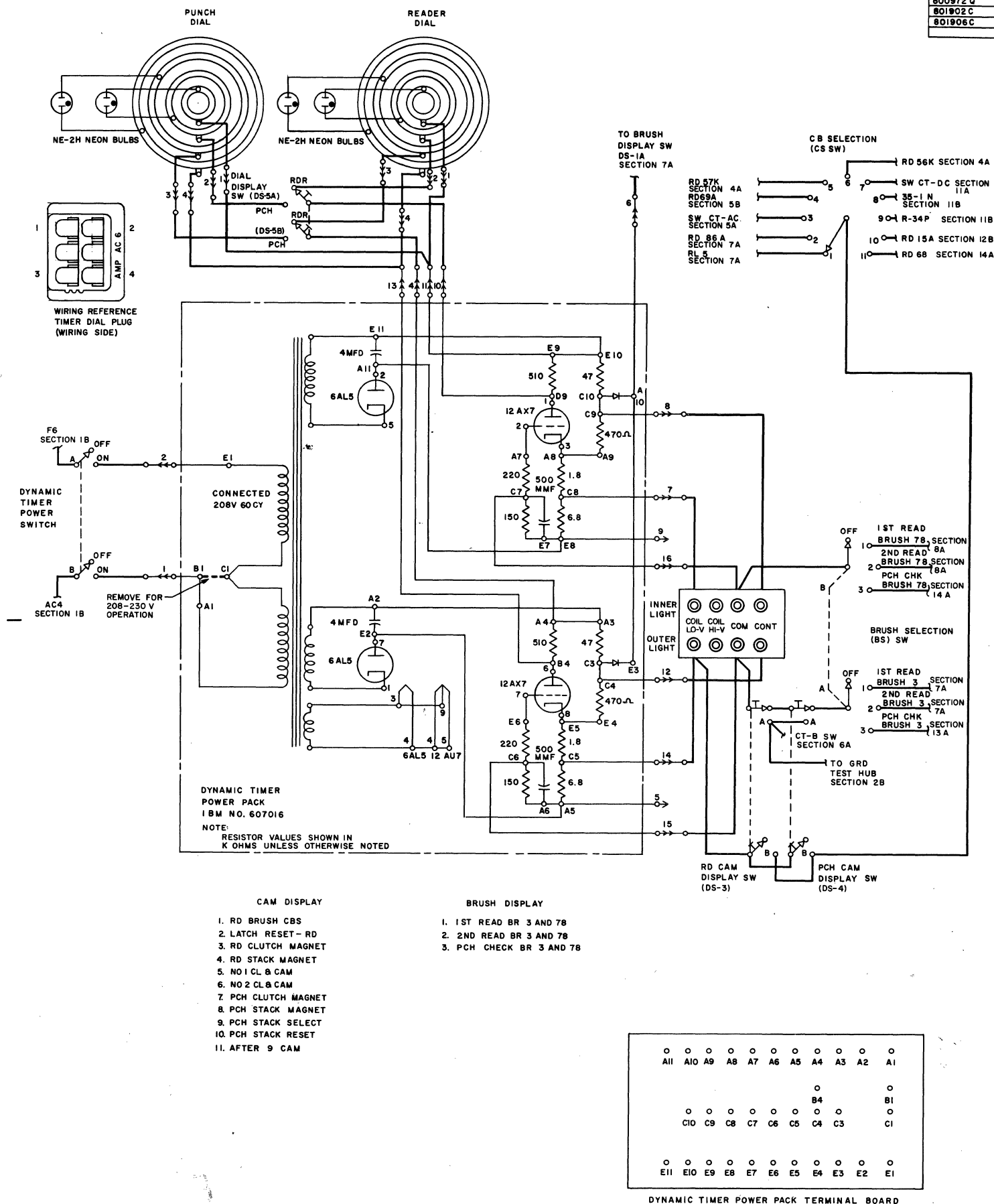
CHANGE NO
 800972 Q
 801906 C



11.04.11.1

CHANGE NO
800972 Q
801755
801906C

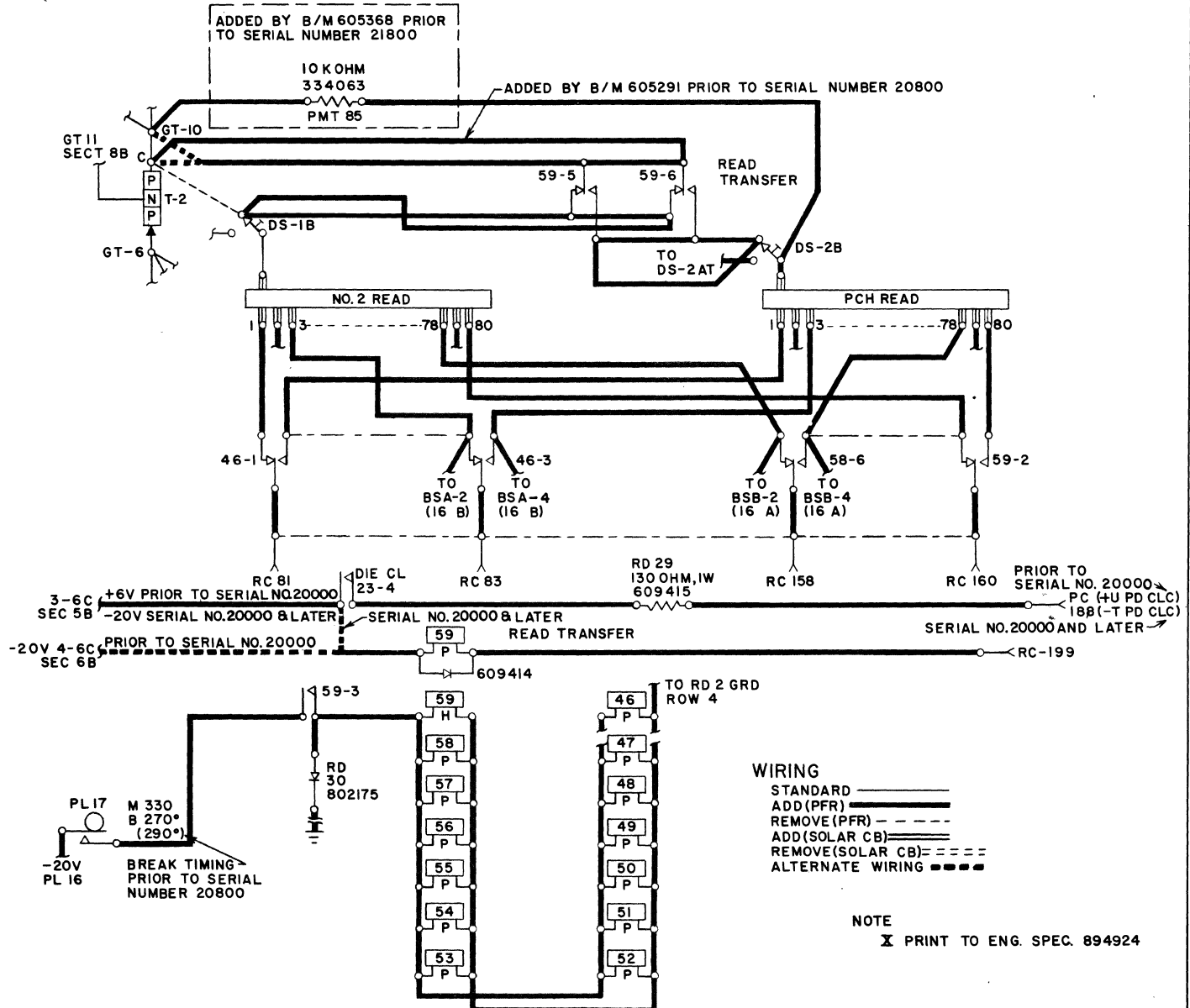
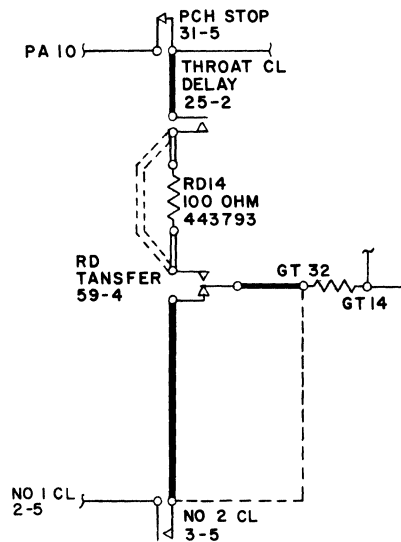




DISCONTINUED

PFR MACHINES ONLY

REL	RC	LOC	REL	RC	LOC	REL	RC	LOC
46-1	81	13AB	50-4	108	NS	55-1	135	NS
46-2	82	NS	50-5	109	NS	55-2	136	NS
46-3	83	13AB	50-6	110	NS	55-3	137	NS
46-4	84	NS	51-1	111	NS	55-4	138	NS
46-5	85	NS	51-2	112	NS	55-5	139	NS
46-6	86	NS	51-3	113	NS	55-6	140	NS
47-1	87	NS	51-4	114	NS	56-1	141	NS
47-2	88	NS	51-5	115	NS	56-2	142	NS
47-3	89	NS	51-6	116	NS	56-3	143	NS
47-4	90	NS	52-1	117	NS	56-4	144	NS
47-5	91	NS	52-2	118	NS	56-5	145	NS
47-6	92	NS	52-3	119	NS	56-6	146	NS
48-1	93	NS	52-4	120	NS	57-1	147	NS
48-2	94	NS	52-5	121	NS	57-2	148	NS
48-3	95	NS	52-6	122	NS	57-3	149	NS
48-4	96	NS	53-1	123	NS	57-4	150	NS
48-5	97	NS	53-2	124	NS	57-5	151	NS
48-6	98	NS	53-3	125	NS	57-6	152	NS
49-1	99	NS	53-4	126	NS	58-1	153	NS
49-2	100	NS	53-5	127	NS	58-2	154	NS
49-3	101	NS	53-6	128	NS	58-3	155	NS
49-4	102	NS	54-1	129	NS	58-4	156	NS
49-5	103	NS	54-2	130	NS	58-5	157	NS
49-6	104	NS	54-3	131	NS	58-6	158	14AB
50-1	105	NS	54-4	132	NS	59-1	159	NS
50-2	106	NS	54-5	133	NS	59-2	160	14AB
50-3	107	NS	54-6	134	NS	59-3	---	13AB
						59-4	---	14AA

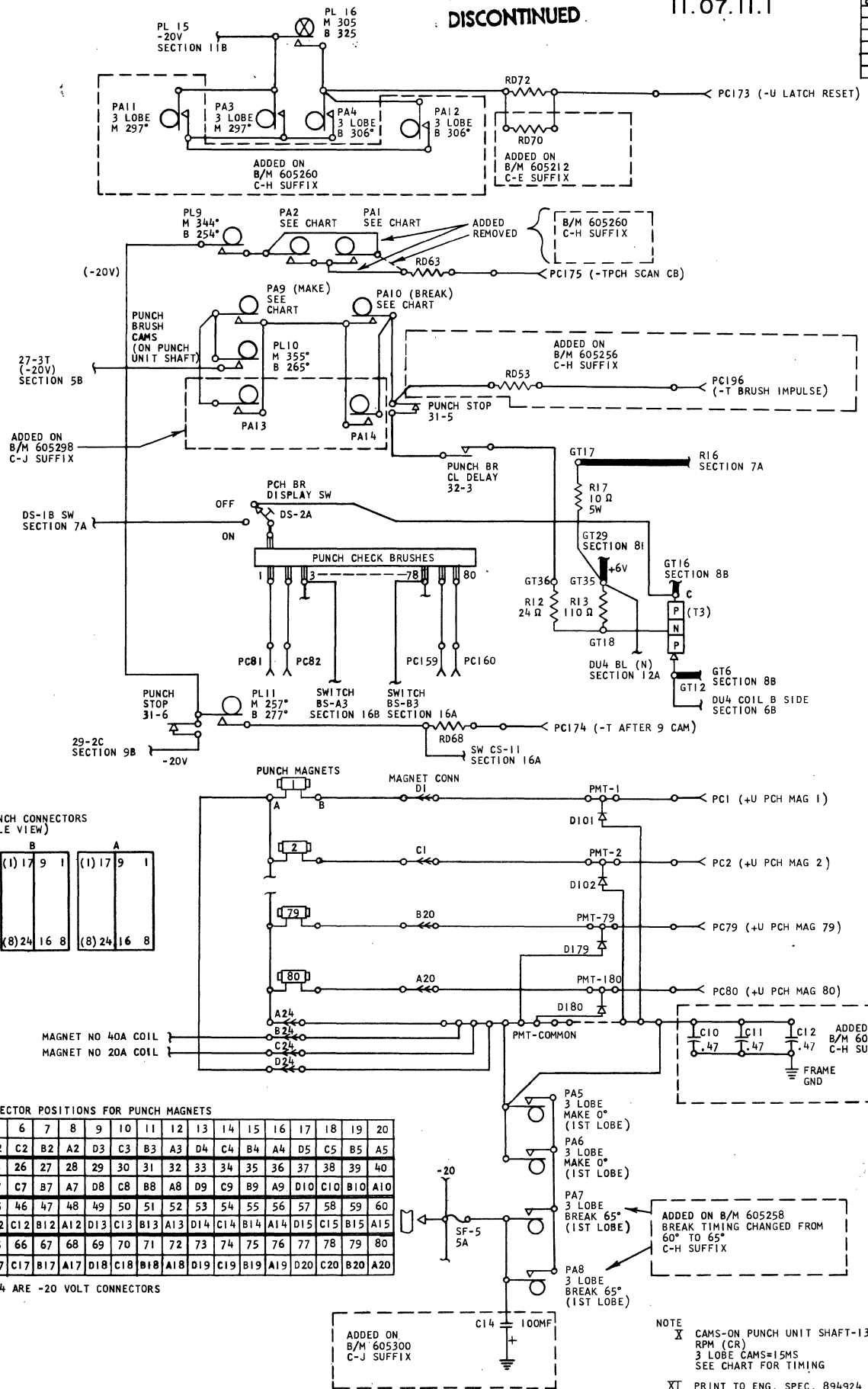


PUNCH READ AND PUNCH

DISCONTINUED

11.07.11.1

CHANGE NO.
802843K

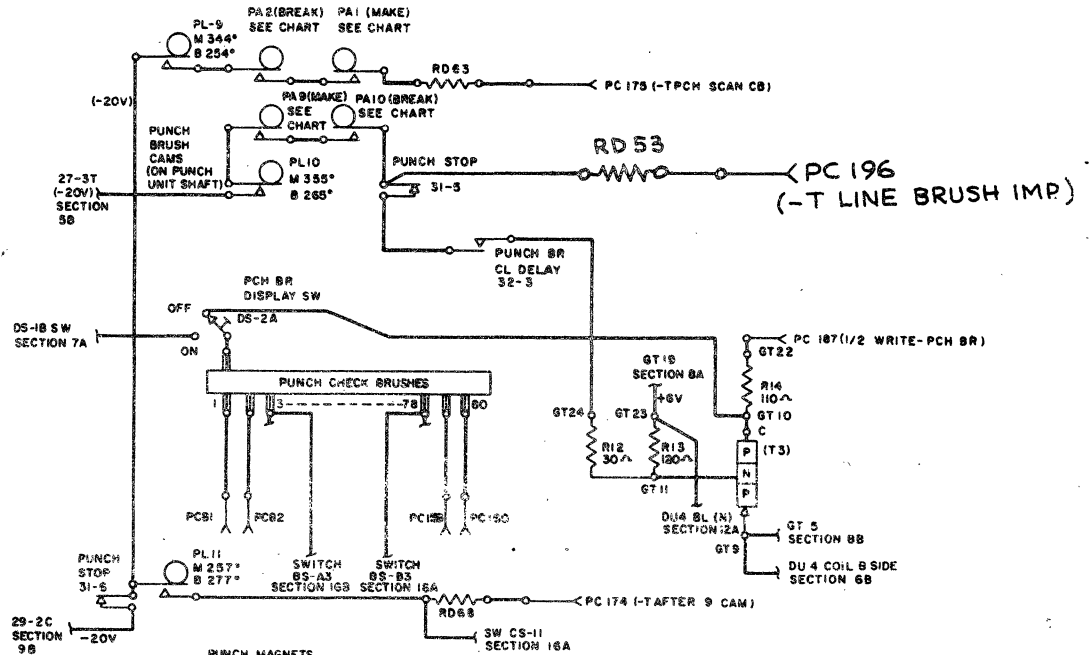
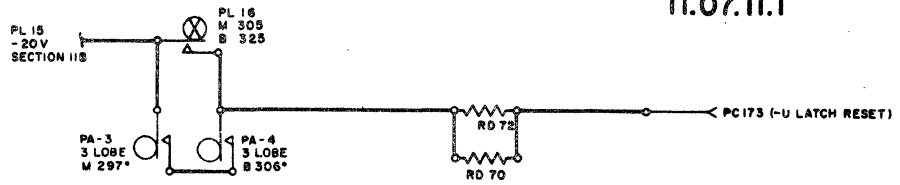


PUNCH READ AND PUNCH

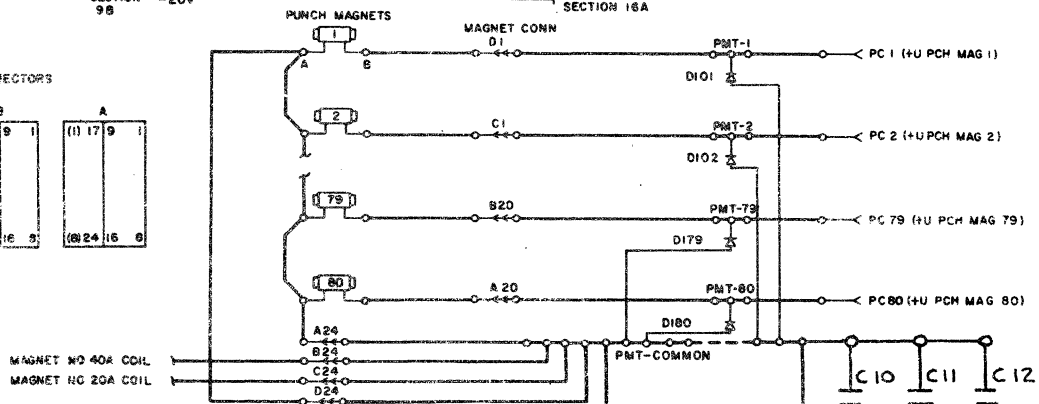
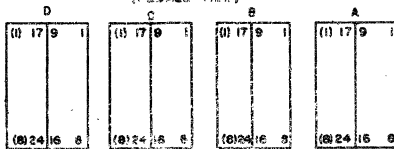
11.07.11.1

CHANGE NO
8009720
8014248
801755
801802C
801802F

802332
802334
802336



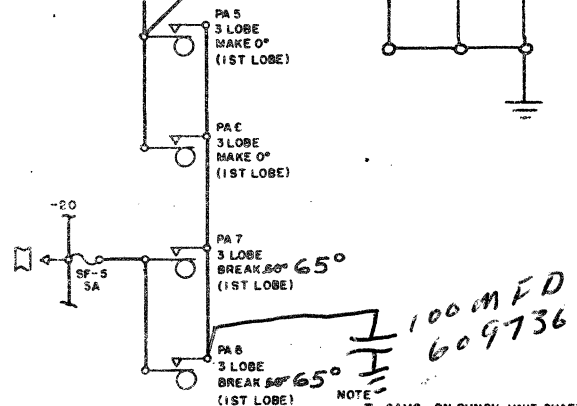
MINIATURE PUNCH CONNECTORS (FEMALE VIEW)



CONNECTOR POSITIONS FOR PUNCH MAGNETS

PCH MAG POS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CONN POS	D1	C1	B1	A1	D2	C2	B2	A2	D3	C3	B3	A3	D4	C4	B4	A4	D5	C5	B5	A5
PCH MAG POS	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
CONN POS	D6	C6	B6	A6	D7	C7	B7	A7	D8	C8	B8	A8	D9	C9	B9	A9	D10	C10	B10	A10
PCH MAG POS	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
CONN POS	D11	C11	B11	A11	D12	C12	B12	A12	D13	C13	B13	A13	D14	C14	B14	A14	D15	C15	B15	A15
PCH MAG POS	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
CONN POS	D16	C16	B16	A16	D17	C17	B17	A17	D18	C18	B18	A18	D19	C19	B19	A19	D20	C20	B20	A20

CONN POS A24, B24, C24, AND D24 ARE -20 VOLT CONNECTORS



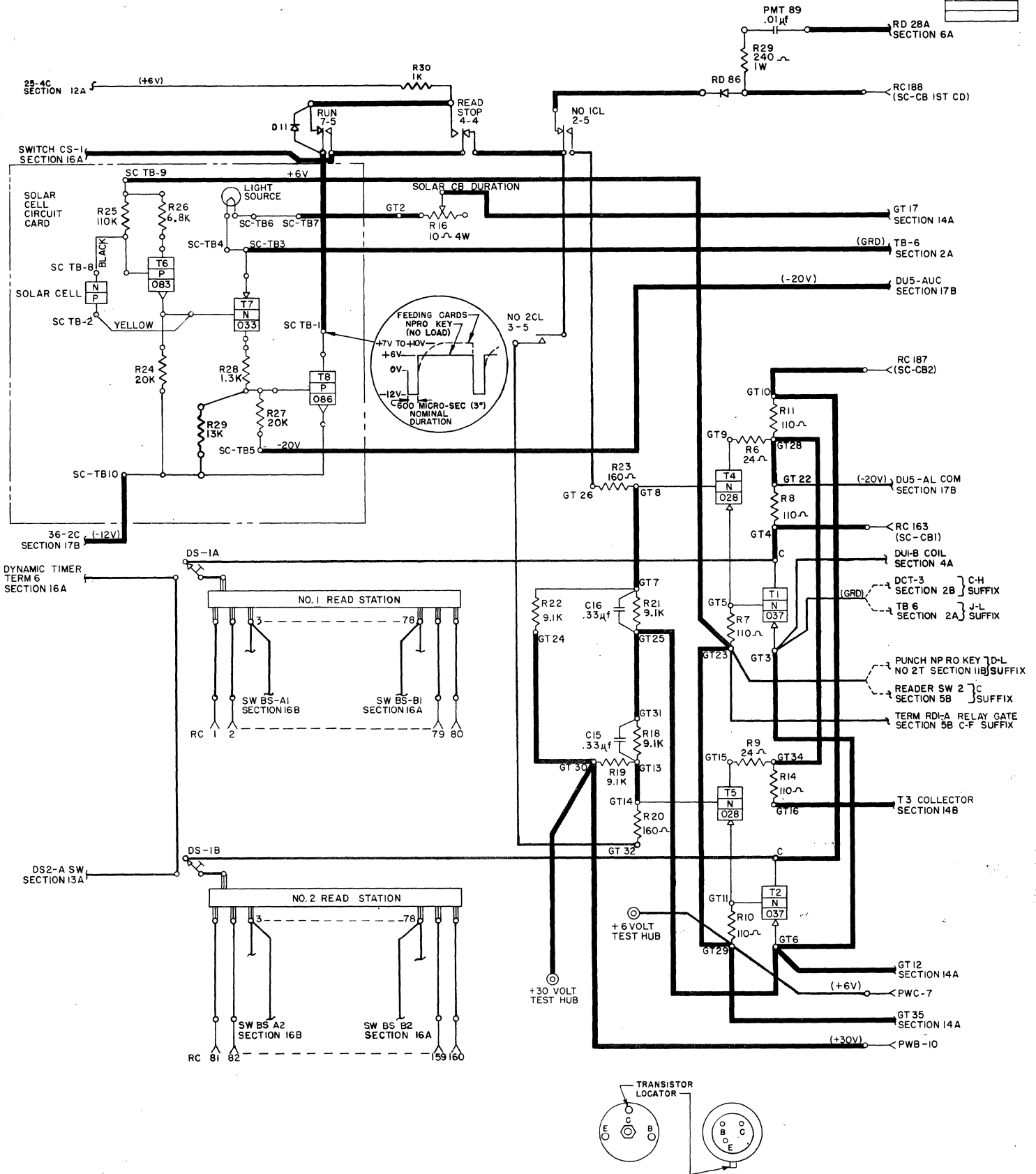
100 MFD
609736

NOTE
I CAMS - ON PUNCH UNIT SHAFT-1333 1/3 RPM (CR)
3 LOBE CAMS-15MS
SEE CHART FOR TIMING

11.04.11.1

605438

CHANGE NO.
802843H
804340



NOTE

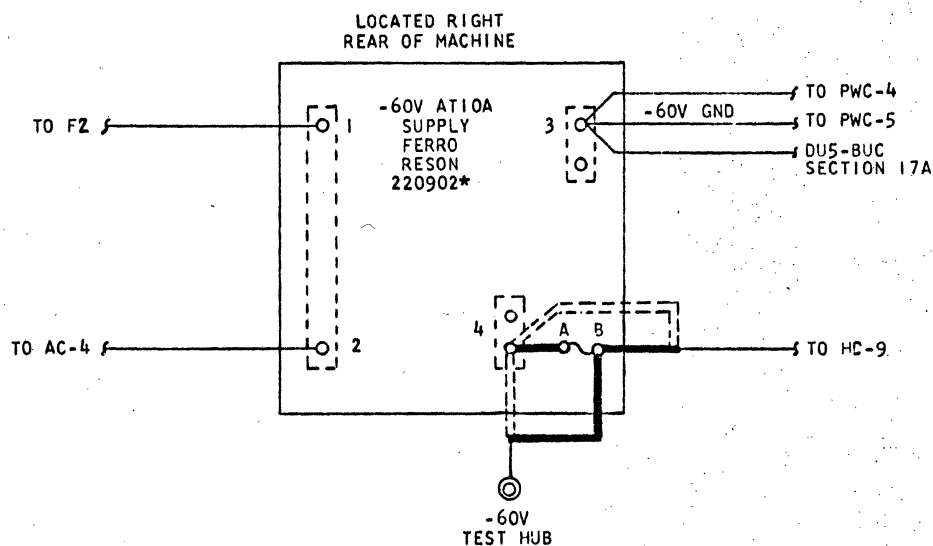
PRINT TO ENG. SPEC. 894924

FIELD USE

635623

POWER SUPPLY
 PARTIAL VIEW OF WIRING DIAGRAM (P/N 609802)
 SECTION 1 & 2

B/m 635619
 EC 809274

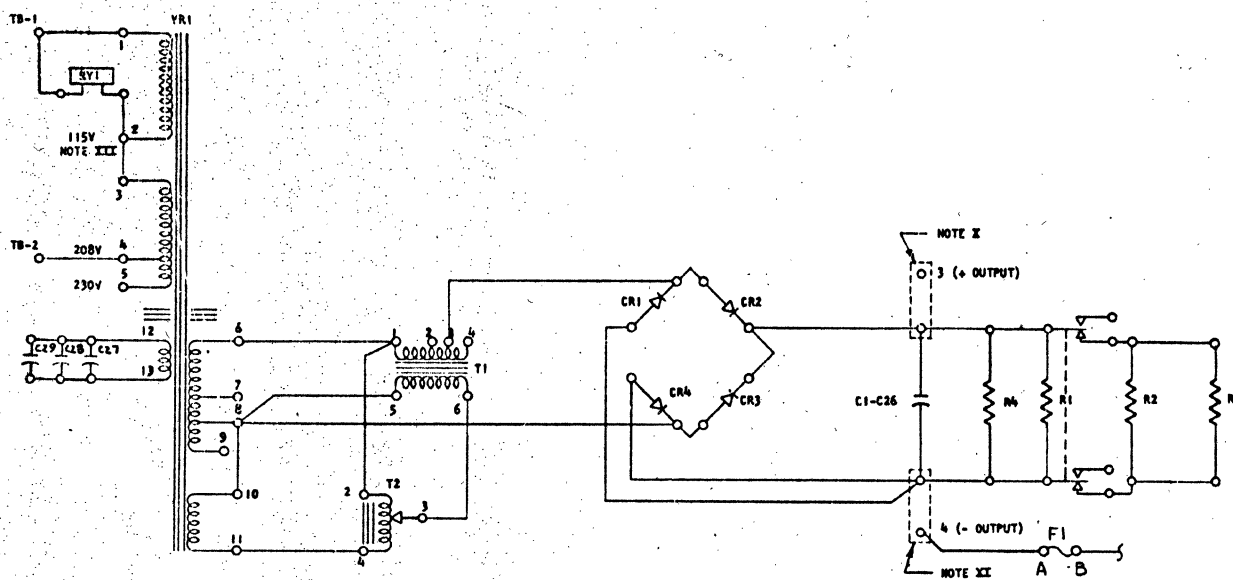


- * USE 10A FUSE (P/N 107669) AND 20A POWER SUPPLY (P/N 480765) WITH NUMERIC CHAIN PRINTER.
 USE INPUT TERMINAL 1 AND 4 FOR 208V, 1 AND 5 FOR 230V.

INTERNATIONAL BUSINESS MACHINES CORP.			DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	OVERCURRENT PROTECTOR		6-29-65	809274			X PRINT TO ENG. SPEC. NO. 894924	
	-60V @ 10A AND 20A							
DESIGN	WLZ	2-10-65	MODEL	1402-1			WHERE USED	
DETAIL	WLZ	2-10-65					635619	
CHECK	WEM	4-7-65	DRAW				635621	
APPRO			CHECK					635623

220903B

DATE	CHANGE NO.
10-22-59	1055816
1-14-60	1055858
3-11-60	1055855
3-61	111210
2-4-65	704772



COMPONENT CHART

CODE	PART NO.	DESCRIPTION
VR1	221342	VOLTAGE REGULATOR
T1	221256	TRANSFORMER, BUCK-BOOST
T2	360310	TRANSFORMER, AUTO
C1-C26	208232	CAPACITOR 3500 MFD 75V DC
C27-C29	207361	CAPACITOR 15 MFD 330V AC
CR1-CR4	127324	DIODE
R1, R4	505298	RESISTOR 150 OHM 50W
R2	322739	RESISTOR 50K 50W
R3	208225	RESISTOR 25K 50W
RV1	242618	RELAY
F1	69791	FUSE 10 AMP

NOTES

- X - CAPACITOR BUS PLATE PART NUMBER 221982
 XI - CAPACITOR BUS PLATE PART NUMBER 222011
 XII - FOR 115V AC OPERATION CONNECT TAPS 1 TO 3
 AND 2 TO 5 AND CONNECT INPUT TO 1 AND 2.
 REMOVE JUMPER 2 TO 3.

INTERNATIONAL BUSINESS MACHINES CORP.				
NAME	WIRING DIAGRAM - POWER SUPPLY -			
60 V DC AT 10 AMPS				
DESIGN	PLCO	3-17-59	MISC	
DETAIL	ALB	9-1-59	NONE	
CHECK	WPC	9-1-59	DRAW	
APPRO	RLW	10-22-59	CHECK	

605311-A

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1402-1 FIELD BILL OF MATERIAL
RELAY 13 ADDITION

DISCONTINUED
NAME

PART #
605314

RELAY 13 ADDITION AND
ADDITIONAL NOISE SUPPRESSION

E.C. LEVEL
802669-C

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	RELAY 13 ADDITION				802669-C			X PRINT TO ENG. SPEC. NO. 894924	
					802669-G				
DESIGN	RPC	11-2-6	MODEL	1402-1					
DETAIL	RPC	11-2-6							
CHECK	J C	11-2-6	DRAW						
APPRO			CHECK						605311

605311

DISCONTINUED
INSTRUCTIONS

INSTRUCTION

605314

RELAY 13 ADDITION AND ADDITIONAL NOISE SUPPRESSION

PRE-REQUISITES:

1. Bill of Material 605295 No. 1 Card Lever Delay Relay prior to "K" Suffix.
2. Bill of Material 605219 Punch Magnet Noise Suppresser prior to "J" Suffix.

SPECIAL TOOLS REQUIRED: None.

INSTALLATION TIME: 2 Hours.

PURPOSE:

1. To prevent card lever bounce or card jam from interrupting process feed before feeding is stopped.
2. To add arc suppression to prevent the drop of relays 2 and 3 from causing punch checks on reader runout.

DESCRIPTION: Under certain conditions of feeding or on a jam at the No. 1 card lever, it is possible to pick read stop relay #4 before processing of the card at second read has begun. This will result in the card at second read going to the stacker without being processed. Relay 13 is added to delay the pick of relay 4.

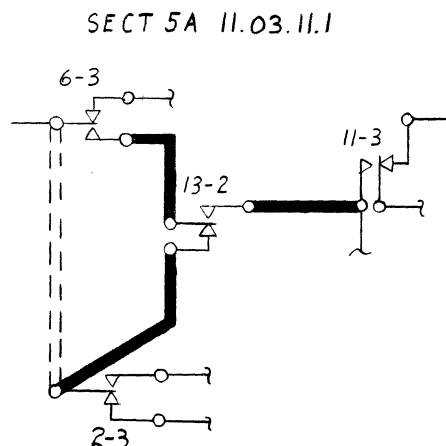
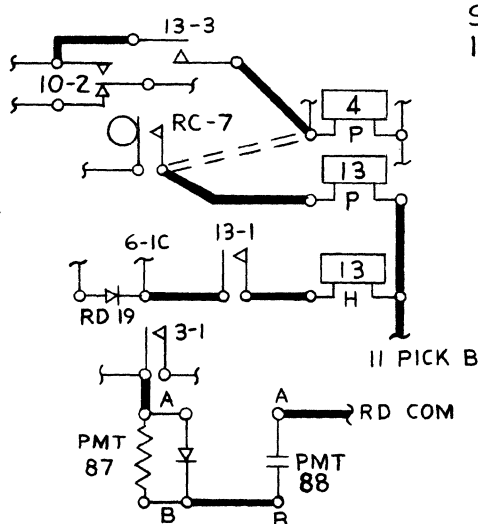
The arc suppression on relay 2 and 3 is added to suppress noise spikes on reader runout which may cause punch checks on a combined operation. RL-2 timing is advanced to compensate for the delayed drop of R2 and 3 caused by the arc suppression circuit.

INSTALLATION:

1. Remove all machine power.
2. Mount relay 13 on the top row of the relay gate directly over R-35 using the following parts: moulding 344599, clip 159944, screw 198363 (2), relay 719005, dust cover 602955.
3. Remove the wire from RC-7 to relay 4 pick at R4, remove the plug and pull the wire back through the lacing to terminate at R13 pick. Use plug 187243.
4. Remove the jumper from 6-3T to 2-3C.
5. Add the following wires using wire 601453 and plug 187243(10).
 - A. 2-3C to 13-2N
 - B. 6-3T to 13-2C
 - C. 3-1C to PMT 87A
 - D. RD19B to 13-1C
 - E. 13-3T to 4 PICK A
6. Add jumper 129245 from 13-2T to 11-3T.
7. Add jumper 129245 from PMT 88A to the RD common row (Row 4 of relay gate).
8. Add jumper 129243 from PMT 87B to PMT 88B.
9. Add jumper 129243 from 13-1T to 13 hold A.
10. Add jumper 129245 from 13-3C to 10-2T.
11. Add brass jumper 205331 from 13 hold B to 13 pick B.
12. Add jumper 129245 from 13 hold B to 11 pick B.
13. Add resistor 315970 and diode 441318 from PMT 87 A to B. Positive end of diode to the B side.
14. Add capacitor 609746 to PMT 88, A to B. Note: On a limited number of "J" Suffix machines, diodes have been added to PMT 87 and 88 by Bill of Material 605307. If this is on the machine for PMT 87 and 88, remove the diodes and wiring.
15. Change timing of RL2 from M 286°, B 246° to M 270°, B 230°.

TESTING: Test for proper operation.

AFTER INSTALLATION: Fill out necessary forms and mark wiring diagram.



INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.	INSTRUCTION
NAME RELAY 13 ADDITION					802669C			X PRINT TO ENG. SPEC. NO. 894924		
DESIGN RPC 11-2-61				2-27-62	802669-G			WHERE USED:		
DETAIL RPC 11-2-61								605311		
CHECK 9F 11-28-61									605314	
APPRO										

609779D

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1402-1 FEATURE WIRING DIAGRM
INSTALL EARLY READ FEATURE

SECTION	NAME	PART NUMBER	ENGINEERING CHANGE NO.
3-4	CIRCUITS (C SUFFIX)	609837	802843-A
3-4	CIRCUITS (D-H SUFFIXES)	609824	802843-A
3-4	CIRCUITS (J-L SUFFIXES)	609825	802928
3-4	CIRCUITS (M SUFFIX)	610303	802843-A
5-6	CIRCUITS (C-D SUFFIXES)	609826	803330
5-6	CIRCUITS (E-F SUFFIXES)	609827	803330
5-6	CIRCUITS (G-L SUFFIXES)	609828	803330
5-6	CIRCUITS (M SUFFIX)	609829	802843-A
23-24	TIMINGS (C-L SUFFIXES)	609830	802843-A
23-24	TIMINGS (M SUFFIX)	610304	802843-A
25-26	LOCATIONS (C-M SUFFIXES)	609831	802843-A
29-30	TIMINGS (C-L SUFFIXES)	609832	802928
29-30	TIMINGS (M-SUFFIX)	609781	803330
33-34	LOCATIONS (C-K SUFFIXES)	609833	802928
33-34	LOCATIONS (L SUFFIX)	609794	802928
33-34	LOCATIONS (M SUFFIX)	610306	802843-A
35-36	LOCATIONS (C-L SUFFIXES)	609834	802620-B
35-36	LOCATIONS (M SUFFIX)	609795	802843-A
37-38	LOCATIONS (C-L SUFFIXES)	609835	802843-A
37-38	LOCATIONS (M SUFFIX)	609799	802843-A

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	INSTALL EARLY READ			11-1-61	802620-B	7-19-62	803330-F	X PRINT TO ENG. SPEC. NO. 894924	
FEED				12-27-61	802928				
DESIGN	HCK	7-12-62	MODEL 1402-1	2-9-62	802928-A				
DETAIL	HCK	7-12-62		3-16-62	802843-A				
CHECK	DEF	7-12-62	DRAW	6-15-62	803330				
APPRO	RLS	7-13-62	CHECK						609779-D

605379

INSTRUCTIONS

DISCONTINUED
INSTRUCTIONS

PREVENT CAPACITOR DISCHARGE NOISE

PRE-REQUISITES:

1. 605219 PUNCH MAGNET NOISE SUPPRESSION ON MACHINES PRIOR TO "J" SUFFIX
2. 605263 ON MACHINES PRIOR TO SERIAL #20760.

SPECIAL TOOLS REQUIRED: NONE

INSTALLATION TIME: .5 HOURS

PURPOSE: TO PREVENT CAPACITOR DISCHARGE ON A COMBINED OP FROM
CAUSING EXTRA READ CLUTCH CYCLES.

DESCRIPTION: A CAPACITOR HAS BEEN INSTALLED ON RD 50 TO PREVENT NOISE SPIKES FROM THE READ CLUTCH MAGNET FROM CAUSING PUNCH CHECKS ON A COMBINED READ PUNCH OP. (B/M 605263 WAS ISSUED FOR FIELD MACHINES) IT HAS SINCE BEEN FOUND THAT THE DISCHARGE OF THIS CAPACITOR CAN, UNDER SOME CONDITIONS, CAUSE THE READ FEED TRIGGER TO TURN ON AND MAY OCCASIONALLY CAUSE AN EXTRA READ CYCLE. A RESISTOR IS ADDED IN SERIES WITH THE CAPACITOR TO PREVENT THE RAPID DISCHARGE OF THIS CAPACITOR.

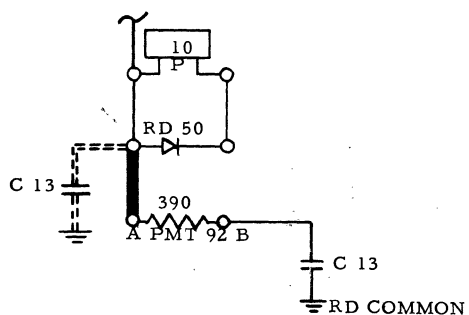
INSTALLATION:

1. REMOVE MACHINE POWER.
2. REMOVE CAPACITOR RD 50 PART # 609746.
3. ADD 390 OHM RESISTOR 2114246 TO PMT 92 POSITION. A TO B TERMINALS. (ROW 5 ON RELAY GATE)
4. ADD JUMPER WIRE FROM RD 50 A TO PMT 92A. USE WIRE 601453 AND CLIPS 187243 (2).
5. REINSTALL CAPACITOR 609746 FROM PMT 92B TO THE RD COMMON TERMINAL ROW. (ROW 4 ON RELAY GATE).

TESTING: TEST ON A COMBINED READ-PUNCH OP.

AFTER INSTALLATION: MARK W/D AND FILL OUT NECESSARY FORMS.

SECT 5 A 11.03. 11.1



INTERNATIONAL BUSINESS MACHINES CORP.			DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	PREVENT CAPACITOR		2-1-62	802949			X PRINT TO ENG. SPEC. NO.	
DISCHARGE NOISE							894924	
DESIGN	RPC	1-18-62					WHERE USED:	
DETAIL	RPC	1-18-62					605378	
CHECK	DEB	1-18-62						
APPRO	RLS	1-22-62						605379

605413

DISCONTINUED

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1402-1 FEATURE WIRING DIAGRAM

CURRENT BALANCE CORRECTION MACHINES 609400-C TO 609400-M.

<u>SECTION</u>	<u>NAME</u>	<u>PART NUMBER</u>	<u>ENGINEERING CHANGE NO.</u>
INSTRUCTION	INSTRUCTION	605414	803330-D

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	CH 609400-C THRU M FOR CURRENT BALANCE CORRECTION	9-21-62	803330-D			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN	RJT 6-15-62 MODEL						
DETAIL	RJT 6-15-62						
CHECK	HAL 6-21-62 DRAW						
APPRO	DEB 9-12-62 CHECK						605413

INDEX

605414

5/2/63

HBK

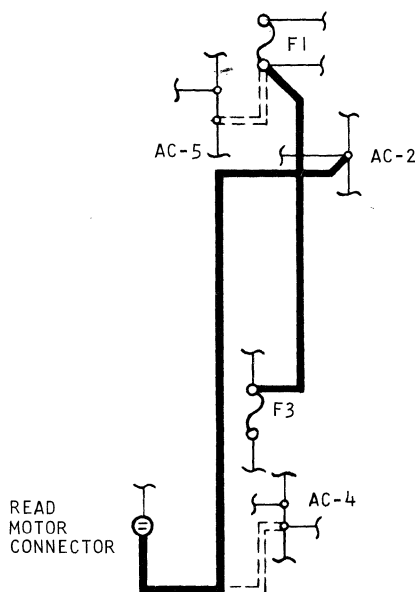
DISCONTINUED

INSTRUCTIONSCURRENT BALANCE CORRECTION: MACHINES W/D 609400-C TO W/D 609400-M.PRE-REQUISITES: NONESPECIAL TOOLS REQUIRED: NONEINSTALLATION TIME: .5 HOURSPURPOSE: TO CORRECT UNDESIRABLE CURRENT UNBALANCE ON THE A.C. INPUT SOURCE ON ALL MACHINES.DESCRIPTION:

THE LOAD ON EACH OF THE THREE PHASES IS REDISTRIBUTED TO ACHIEVE A BALANCED LINE CURRENT BY RECONNECTING THE READER MOTOR AND FERRO RESONANT INPUT.

INSTALLATION:

1. REMOVE ALL POWER TO MACHINE DURING INSTALLATION.
2. DISCONNECT AND TAPE BOTH ENDS OF THE CABLE LEAD CONNECTING FUSE 1 (SCREW TYPE FUSE) CENTER POST TO TERMINAL AC 5 (LOCATED ON LOWER LEFT BEHIND FUSE PANEL). SEE DRAWING.
3. INSTALL JUMPER 512533 BETWEEN FUSE 1 CENTER POST AND FUSE 3 CENTER POST.
4. MOVE THE READ MOTOR LEAD AT TERMINAL AC 4 TO TERMINAL AC 2. SEE DRAWING.



DRAWN IN

WD 609400 SECTION 1A & B

TESTING: CHECK FOR PROPER OPERATIONAFTER INSTALLATION: MARK WIRING DIAGRAM AS IN DRAWING.

INTERNATIONAL BUSINESS MACHINES CORP.			DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	CURRENT BALANCE CORRECTION WD609400 C-M		9-21-62	803330-D			X PRINT TO ENG. SPEC. NO.	
DESIGN	RJT	6-15-62	MODEL	1402-1				
DETAIL	RJT	6-15-62					WHERE USED	
CHECK	DEB	6-21-62	DRAW				605413	
APPRO	DEB	9-12-62	CHECK					605414

INSTRUCTION

605366 E

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FIELD USE

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1402-1 FIELD B/M
READER SOLAR CB

SECTION	NAME	PART NO.	E. C. NO.
INSTRUCTION	SOLAR CB INSTALLATION	605429	809773
INSTRUCTION	SOLAR CB INSTALLATION	605430	804340
INSTRUCTION	PARTS CATALOG ADDITON-	605431	809773
INSTRUCTION	SOLAR CB INSTALIA TION	605432	804795
INSTRUCTION	SOLAR CB INSTALLATION	605433	804795
INSTRUCTION	REF MANUAL ADDITION -	605434	804340
INSTRUCTION	SOLAR CB INSTALLATION	605436	802843-K
7-8	W/D RDK RD 1/2 WHITE	605437	804340
7-8	W/D KDK RD	605438	804340
13-14	W/D PCH R D & PCH 1/2 WHITE	605439	802843-K
13-14	W/D PCH RD & PCH	605440	802843-K
13A-14A	W/D PCH RD FEATURE	605441	802843-K
INSTRUCTION	W/D CHANGES	605442	802843-K
INSTRUCTION	W/D CHANGES	605443	802843-K
INSTRUCTION	W/D CHANGES	605444	804340
21A-22A	W/D ADDITION	605445	802843-K
INSTRUCTION	W/D CHANGES	605446	802843-K
INSTRUCTION	W/D CHANGES	605447	802843-K
33A-34A	W/D ADDITION	605448	804340
35A-36A	W/D ADDITION	605449	802843-K
INSTRUCTION	W/D CHANGES	605450	802843-K

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME READER SOLAR CB				7-20-62	802843-K	8-18-65	809773	X PRINT TO ENG. SPEC. NO. 894924 USED IN 1402-1	
				11-13-62	804340				
				4-9-63	804795				
				3-3-64	805464A				
				4-2-65	809268				
DESIGN	DET	5-3-6	MODEL	1402-1					605366 E
DETAIL	05B	7-6-62							
CHECK	HCN	7-6-62	DRAW						
APPRO	CLS	7-11-62	CHECK						

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U. S. GOV. NO. 10707 4-60

FIELD USE

605429

SOLAR CIRCUIT BREAKERPREPARATION:

- A. READ INSTRUCTIONS COMPLETELY AND STUDY INSTRUCTION DRAWINGS, TO BECOME AQUAINTED WITH PROCEDURES AND PARTS USED.
- B. CHECK BILL OF MATERIAL FOR BOTH THE 1401 AND 1402 INVOLVED IN THIS CHANGE TO DETERMINE THAT ALL PARTS WERE RECEIVED. PROCURE ANY MISSING PARTS BEFORE BEGINNING INSTALLATION. RUN READ, PUNCH, (AND PFR IS APPLICABLE) TESTS BEFORE STARTING INSTALLATION.

PRE-REQUISITES:

B/M 605312 REAR MACHINE SAFETY COVER, B/M 605218 3V POWER SUPPLY INPUT (ON W/D 609400G ONLY MAKES PWB 10 AVAILABLE), AND ONE OF FOLLOWING APPLICABLE 1401 BILLS OF MATERIAL, TO BE INSTALLED CONCURRENTLY WITH SECTION III OF THIS BILL OF MATERIAL: 485753, 485754, 485755, 485756, OR 485922.

SPECIAL TOOLS AND/OR MATERIALS REQUIRED:

LARGE HACK SAW, ELECTRIC DRILL WITH 1/4" BIT

INSTALLATION TIME:

A TWO MAN TEAM IS RECOMMENDED FOR INSTALLATION OF THIS B/M AND THE COMPANION 1401 B/M. SECTIONS I AND II CAN BE DONE SIMULTANEOUSLY OR INDEPENDENTLY OF EACH OTHER. NORMAL 1402 OPERATION CAN BE RESUMED AFTER SECTIONS I AND II ARE INSTALLED. SECTION III HOWEVER, MUST BE INSTALLED CONCURRENTLY WITH THE 1401 COMPANION B/M. SEE SECTIONS I, II, AND III TO DETERMINE ESTIMATED INSTALLATION TIME.

PURPOSE:

TO PROVIDE IMPROVED READING RELIABILITY AND TO REDUCE THE MAINTENANCE REQUIREMENTS OF THE 1402 READER.

DESCRIPTION:

READ IMPULSE CAMS K14, 5, 6, 7, 8, AND 9 ARE REPLACED WITH THE SOLAR CB UNIT TO PROVIDE UNIFORM BOUNCE-FREE READ IMPULSES. A LIGHT BEAM IS ALLOWED TO STRIKE A SOLAR CELL AT INDEX POINTS 9 THROUGH 12 BY A SLOTTED DISC MOUNTED ON THE READ PICKER KNIFE SHAFT. THE PULSE GENERATED IS FED INTO A THREE STAGE TRANSISTOR AMPLIFIER LOCATED IN THE SOLAR CELL UNIT WHICH IN TURN FEEDS A NEW TRANSISTOR PANEL MOUNTED ON THE RELAY GATE. CB TIMING IS CONTROLLED BY THE RELATIONSHIP OF THE DISC SLOTS TO THE LIGHT BEAM. THE DURATION IS CONTROLLED BY A POTENTIOMETER ON THE RELAY GATE TRANSISTOR PANEL. THE DYNAMIC TIMER CIRCUITRY IS ALSO CHANGED TO MINIMIZE DELAY IN NEON LAMP IGNITION TIME AND TO PROVIDE PUNCH STACKER CARD LEVER TIMING INDICATION.

INSTALLATION:SECTION I SOLAR CB MECHANICAL HARDWARE-INSTALLATION TIME: 1,0-1,5.

1. REMOVE ALL MACHINE POWER.
2. REMOVE RIGHT END, REAR AND REAR MACHINE SAFETY COVERS. REMOVE THE CAST HOPPER FILLER AND RIGHT FEED COVERS AS SEPARATE PARTS. (THIS ELIMINATES NEED TO REMOVE JOGGLER). REMOVE DRIVE PULLEY 602496, DRIVE BELT, BEARING RETAINER, RETAINER MOUNTING SCREWS, AND FILE FEED JOGGLER SPRING STUD.
3. USE HACK SAW TO CUT 7/8" ± 1/32" OFF THE REAR END (OPPOSITE END FROM KLCB'S) OF THE PICKER KNIFE CAM SHAFT.
CAUTION: PROTECT LOWER BASE POWER SUPPLIES, ETC. FROM FALLING METAL CHIPS.
4. INSTALL SUPPORT CASTING 610740 AND O-RING 194989 USING NEW BEARING RETAINER SCREWS, WASHERS AND FILE FEED JOGGLER SPRING STUD. REINSTALL PICKER KNIFE DRIVE PULLEY 602496 SIMULTANEOUSLY WITH SUPPORT CASTING.
5. REMOVE PICKER KNIFE SHAFT END PLAY IN EXCESS OF .008" WHEN POSITIONING PICKER KNIFE DRIVE PULLEY. REINSTALL DRIVE BELT.
6. INSTALL SPINDLE 610376 WITH SET SCREWS 123639(2). REFERENCE: INSTRUCTION DRAWING 605431.
REFERENCE: INSTRUCTION DRAWING 605431.
7. REMOVE THE PLASTIC COVER FROM THE EMITTER ASSEMBLY 610350 AND PRE-ASSEMBLE SET SCREWS 257976(3) INTO THE ADAPTER PLATE. REFERENCE: INSTRUCTION DRAWING 605431.
8. INSTALL THE EMITTER ASSEMBLY WITH TERMINAL BLOCK UP AND CENTERED OVER THE EMITTER SPINDLE AND ONTO THE MOUNTING PINS IN SUPPORT CASTING.

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	READ SOLAR CIRCUIT	7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN	BREAKER INSTALLATION	3-3-64	805464A			USED IN 605366	
DETAIL	805 7-6-62		809268				
CHECK	KK 7-6-62		809773				
APPRO	RES 7-11-62						605429

INSTRUCTION

605430

DISCONTINUED

INSTRUCTIONS

SECTION I (Cont'd)

- POSITION ADAPTER PLATE TIGHT AGAINST THE THREE MOUNTING STUD SHOULDERS AND TIGHTEN THE THREE SET SCREWS.
9. INSTALL THE EMITTER DISC 610378 WITH SCREW 34512 AND WASHER 22478. POSITION THE EMITTER DISC SQUARELY AGAINST THE SHOULDER ON THE END OF EMITTER SPINDLE TO AVOID MISALIGNMENT AND/OR BREAKAGE. AVOID EXCESSIVE TIGHTENING OF THE SCREW TO AVOID DISC DAMAGE.
 10. TRIP READ CLUTCH AND ROTATE FEED TO "9" TIME (12°). CENTRALLY LOCATE EMITTER DISC IN EMITTER SLOT BETWEEN SOLAR CELL AND LAMP BY SLIDING EMITTER SPINDLE ON SHAFT. ALSO ROTATE DISC TO A POINT WHERE THE 9 TIME SLOT IS APPROXIMATELY OPPOSITE THE SOLAR CELL OR LAMP. THIS GIVES A ROUGH TIMING ADJUSTMENT. TIGHTEN SPINDLE SET SCREWS AT THIS POINT.
 11. REMOVE THE PORTION OF REAR MACHINE SAFETY SHIELD FOR CLEARANCE TO THE SOLAR CB UNIT AND RE-INSTALL SAFETY SHIELD.

SECTION II

MISCELLANEOUS ELECTRICAL CHANGES-INSTALLATION TIME 1.5-2.0 HOURS.

NOTE: STEPS 5 AND 6 MAY BE HANDLED AS AN INDEPENDENT SECTION TO BE INSTALLED BEFORE OR AFTER SECTION III.

1. REMOVE ALL POWER FROM MACHINE.
2. CHANGE THE 4 POSITION RELAY 7 TO 6 POSITION RELAY 719007 WITH MOULDING 344603 AND CLIP 159945. TRANSFER WIRES AND JUMPERS FROM THE 4 POSITION MOULDING TO THE CORRESPONDING POSITIONS ON THE 6 POSITION MOULDING.
3. DRILL A 1/4 INCH HOLE .625 INCH TO RIGHT OF GRD HUB ON CE AID PANEL AND MOUNT PLUG 604627
4. CUT AND ATTACH THE ".430" PORTION OF LABEL 610385 UNDERNEATH TEST HUB ADDED IN STEP 3. ATTACH THE REMAINING "PUNCH STACK CL" PORTION TO COVER "LATCH RESET" ON THE CB SELECTOR SWITCH CHART.
5. CHANGE THE DYNAMIC TIMER PRIMARY CONNECTION PRIOR TO W/D 609400-L. THE DYNAMIC TIMER PRIMARY CONNECTION REQUIRES CHANGING TO PREVENT MARGINAL OPERATION BY ASSURING THAT 230 VOLTS IS AVAILABLE ON BOTH 208 AND 230 VOLT SUPPLY LINES. REMOVE AND TAPE EACH END OF THE JUMPER RUNNING BETWEEN FUSE F6 AND FUSE F4 (SCREW TYPE FUSES). INSTALL 50 INCH JUMPER 610386 BETWEEN FUSE F6 AND TERMINAL 5 (230 VOLT TAP) ON THE BULK SUPPLY LOCATED ON THE LEFT END OF THE MACHINE. ROUTE AND TAPE WIRE TO CABLES AS REQUIRED AT NECESSARY POINTS TO ELIMINATE POSSIBLE INSULATION ABRASION.
6. DECREASED DELAY OF NEON LAMPS FIRING IS ACHIEVED BY REDUCING THE CAPACITIVE LOAD ON THE DYNAMIC TIMER POWER SUPPLY. THIS IS DONE BY ASSURING THAT THE DIAL DISPLAY SWITCH COMMON RUNS TO THE PLATE SIDES OF THE 12AX7 LOAD RESISTORS CORRESPONDING TO THE INNER AND OUTER LIGHTS. IT IS NECESSARY TO CHANGE ONLY THE OUTER LIGHT WIRING. THIS IS ACCOMPLISHED BY THE FOLLOWING:
 - a. SEPARATE THE 16 POSITION DYNAMIC TIMER POWER SUPPLY CABLE CONNECTOR LOCATED AT THE RIGHT END OF THE MACHINE ABOVE AND TO THE REAR OF THE 20 VOLT POWER SUPPLY.
 - b. SEPARATE THE NYLON CABLE CONNECTOR PLUGS ON BOTH THE PUNCH AND READER DIAL CABLES ON 1402 ABOVE SERIAL 20000.
 - c. BACK OUT AND INTERCHANGE PRONGS 4 AND 13 ON THE FEMALE SIDE OF THE 16 POSITION CONNECTOR.
 - d. USING SMALLEST SCREW DRIVER TO DEPRESS RETAINER ON SIDE OF PRONG WHILE PULLING WIRE. BACK OUT AND INTERCHANGE THE TWO PRONGS AT BOTH THE READER AND PUNCH NYLON CONNECTOR PLUGS CORRESPONDING TO 4 AND 13 (STEP C ABOVE). THIS NECESSARY TO MAINTAIN NEON LAMP POLARITY WITH THE GLOWING ELECTRODE TOWARD THE FRONT. NOTE: RE-FORM THE NYLON CONNECTOR PRONGS AS REQUIRED PRIOR TO RE-INSERTION TO PREVENT BACKING OUT. ON 1402 MACHINES PRIOR TO 20000, REVERSE OUTER NEON WIRES AT READER DIAL TERMINAL BLOCK UNTAPE, CUT, REVERSE AND SPLICE OUTER PUNCH DIAL NEON LEADS. REF. INSTRUCTION DRAWING 605441.
7. PLUS 30 VOLTS MUST BE AVAILABLE ON POWER CONNECTOR PWB10 IN THE 1402 BY CABLE WIRE FROM THE 1401. INSTALL IF NECESSARY THE JUMPER LEAD AS PROVIDED IN THE COMPANION 1401 BILL OF MATERIAL TO ACCOMPLISH THIS.
8. RC163 ON THE 1402 IS CONNECTED BY CABLE WIRE TO THE 1401 PADDLE CONNECTOR AT OIB4COIF. IF THIS CONNECTION DOES NOT EXIST, THE WIRE FROM RC163 WILL BE FOUND WITH THE REMAINING UNUSED WIRES (POSSIBLY IN FRAME CHANNEL) IN THE CABLE TO OIB4. FOLLOW THE CABLE FROM OIB4 COI TO LOCATE UNUSED ENDS AND ROUTE THIS WIRE TO THE VICINITY OF THE PADDLE CONNECTOR AT OIB4COIF, BUT DO NOT MAKE THE CONNECTION UNLESS THE NEXT SECTION OF THIS BILL OF MATERIAL WILL BE INSTALLED IMMEDIATELY.

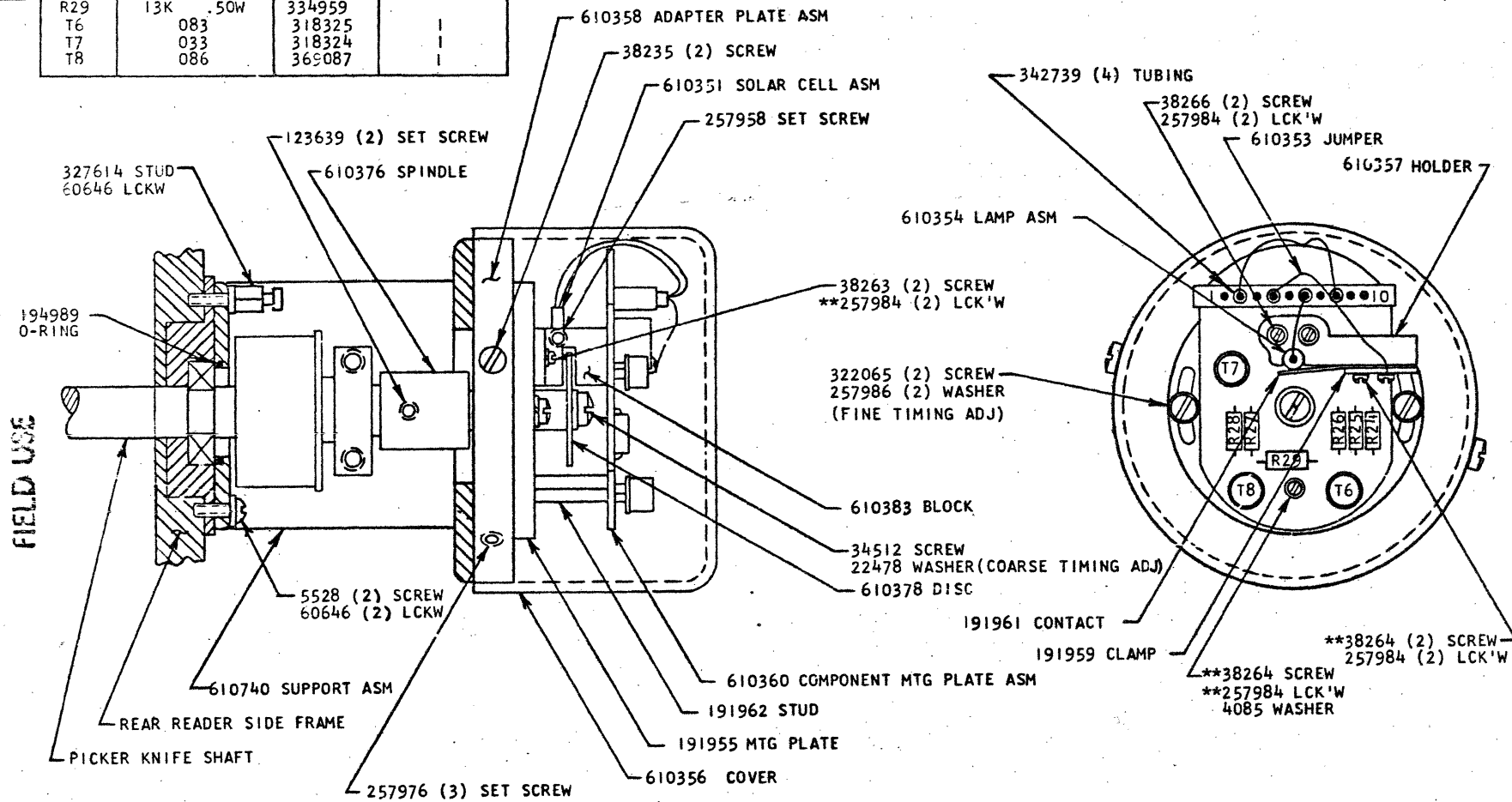
INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	READ SOLAR CIRCUIT	7-20-62	802843K			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN	BREAKER INSTALLATION	11-13-62	804340				
DETAIL	5-10-62 MODEL 1402-1					USED IN 605366	
CHECK	7-6-62 DRAW						605430
APPRO	7-14-62 CHECK						

INSTRUCTION

INSTRUCTION

LOC	DESCRIPTION	P/N	QUANTITY
R24	20K .50W	300723	1
R25	110K .50W	317033	1
R26	6.8K .50W	317025	1
R27	20K .50W	300723	1
R28	1.3K .50W	317429	1
R29	13K .50W	334959	1
T6	083	318325	1
T7	033	318324	1
T8	086	369087	1

FIELD USE



1E7509

INSTRUCTION

DEVELOPMENT NO.

NOTE
X PRINT TO ENG SPEC NO.
894924USED IN:
605366

605431

CHANGE NO.

DATE

CHANGE NO.

DATE

**MULTIPLE USAGE

INTERNATIONAL BUSINESS MACHINES CORP.

NAME SOLAR CB

PARTS CATALOG ADDITION

DESIGNER 5-3-62 MODEL 1402-1

DETAILER 7-6-62

CHECKER 7-2-65

APPROVER 7-11-65

DRAW CLW 4-9-62

CHECK

605432

DISCONTINUED

INSTRUCTIONS

SECTION II (CONT D)

9. ON MACHINES WIRED TO 609400 J-L LEAD FROM PMT 94 TO GROUND IS IN A CABLE REMOVE AND INSULATE THIS LEAD AT BOTH ENDS. INSTALL JUMPER 609745 FROM PMT 94 TO GROUND. FOR CONNECTING TO GROUND, REPLACE THE PRESENT SCREW, WHICH IS ON THE FRONT SIDE OF RELAY CABINET AND IS THE MOUNTING SCREW FOR THE 20 VOLT POWER SUPPLY FAN HOUSING WITH SCREW (186758) AND WASHER (55901). WASHER SHOULD BE MOUNTED BETWEEN JUMPER CLIP AND PANEL TO INSURE GOOD CONTACT.

SECTION III SOLAR CB CIRCUIT CHANGE-INSTALLATION TIME 2, 3-3, 7 HOURS.

1. THIS SECTION MUST BE INSTALLED CONCURRENTLY WITH ONE OF THE 1401 COMPANION BILLS OF MATERIAL LISTED IN THE PRE-REQUISITES.
2. RUN READ AND PUNCH (AND PFR IS APPLICABLE) TEST PRIOR TO INSTALLING THIS SECTION TO REMOVE ANY BUGS PRIOR TO INSTALLATION.
3. IF THE 1402 IS EQUIPPED WITH POROUS BRONZE CONTACT ROLLS (W/D 609400C-J) MACHINE CONTAINS HALF WRITE CIRCUITRY, NEW TRANSISTOR PANEL 610370 MUST BE MODIFIED BY STEPS BELOW FOR MACHINES EQUIPPED WITH HALF WRITE. (OMIT STEPS BELOW FOR MACHINES WITHOUT HALF WRITE I.E. THOSE EQUIPPED WITH CARBON CONTACT ROLLS W/D 609400L AND 609400C-J WITH B/M 605290, 605291, 605292, OR 605293.)

	FROM	TO
RESISTOR 6 24 OHM	GT 9 TO GT 28	GT 9 TO GT 27
RESISTOR 9 24 OHM	GT 15 TO GT 34	GT 15 TO GT 33
JUMPER	GT 34 TO GT 28	GT 33 TO GT 27
JUMPER	GT 22 TO GT 28 (REMOVE)	

4. REMOVE MACHINE POWER
5. IDENTIFY THE LEADS TO THE CAPACITOR TERMINAL MINUS AND PLUS ACCORDING TO CAPACITOR POLARITY.
6. REMOVE THE ADJUSTABLE RESISTOR WITH LEADS IN TACT IN PREPARATION TO TRANSFER TO THE NEW TRANSISTOR PANEL IN PLACE OF RESISTOR INCLUDED ON THIS ASSEMBLY.
7. REMOVE THE OLD TRANSISTOR PANEL WITH LEADS STILL CONNECTED. INSTALL NEW PANEL 610370 WITH NEW SPACERS (4) 213940 AND SCREWS (4) 438579 PROVIDED. ADD RESISTOR REMOVED IN STEP 6 IN PLACE OF ADJUSTABLE RESISTOR ON NEW PANEL.
8. TRANSFER THE WIRES FROM OLD PANEL TO NEW PANEL ACCORDING TO THE TABLE BELOW FOR THE NEW TRANSISTOR GATE TERMINAL (GT) LOCATIONS. CAUTION: IT WILL BE NECESSARY TO SQUEEZE AND/OR TRIM SOME OF THE TERMINAL LUGS TO FIT THE NARROWER SPACE ON THE NEW GATE TERMINALS STRIP TO PREVENT BREAKAGE OF THE INSULATING BARRIERS BETWEEN TERMINALS.

REMOVE FROM OLD GT	INSTALL ON NEW GT
GT 1	GT 3
GT 2 OR 022 COL T1	GT 4 OR 037 COL T1
GT 6 OR 022 COL T2	GT 10 OR 037 COL T2
GT 9	GT 12
GT 10 OR 022 COL T3	GT 16 OR 037 COL T3
GT 14 WITH HALF WRITE ONLY	GT 22 WITH HALF WRITE ONLY
GT 15	GT 23
GT 16	GT 26
GT 17	GT 29
GT 18 WITH HALF WRITE ONLY	GT 28 WITH HALF WRITE ONLY
GT 20	GT 32
GT 22	GT 34 WITH HALF WRITE OR GT 22 WITHOUT HALF WRITE
GT 23	GT 35
GT 24	GT 36
CAP. C9 MINUS TERM	GT 1
CAP. C9 PLUS TERM	GT 19

9. REMOVE AND/OR TAPE THE ENDS OF THE FOLLOWING JUMPERS AND CABLE LEADS: REFER TO 1402 WIRING DIAGRAM SEC. 7 & 8 IF REQUIRED. ("A" REFERS TO UPPER RD TERMINAL, "B" REFERS TO LOWER RD TERMINAL).

FROM	TO
RC 187	RD 88 B
RC 188	RD 14 A
SW-CS-2	RD 86 A
RD 87 B	RL 4 OP
RD 86 B	RL 9 OP
SW-CS-1	RL 5 OP

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	READ SOLAR CIRCUIT	7-20-62	802843-K			X PRINT TO ENG. SPEC. NO. 894924	
	BREAKER INSTALLATION	4-9-63	804795				
DESIGN	DEB 5-10-63 MODEL 1402-1					USED IN 605366	
DETAIL	DEB 7-6-63						
CHECK	HCK 7-6-63 DRAW						
APPRO	RLS 7-11-63 CHECK						605432

DISCONTINUED

9. (Continued)

FROM	TO
4-4C	KL 7 OP
L7-3T	KL 6 OP
4-4N	LD 14B
LD 86A	LD 87A
LD 87A	LD 88A

10. REMOVE RESISTORS RD 14 AND RD 88 AND DIODE RD 87.

11. ADD THE CABLE 610384 AS FOLLOWS:
(SC TB REFERS TO SOLAR CELL TERMINAL BLOCK)

FROM	TO
SC TB1	7-5C
SC TB3	20V POWER SUPPLY TERM 6
SC TB5	DU5-AU COMM.
SC TB7	GT2
SC TB9	GT23
SC TB10	R36-2C
SW-CS-1	7-6T
SW-CS-2	RD 73A
30V PLUG	GT 30
RD 86B	2-5N
RC163	GT4
RC187	GT10
RC188	RD86A
PWB10	GT 30
RD28A	PMT89B

FOR MACHINES WIRED TO 609400C-J WITHOUT CARBON ROLLS:

MOVE THE WIRE AT PWC 9 TO PWD 1 AND CONNECT CABLE LEAD BETWEEN PWC 9 AND SIGNAL FUSE 7. SEE INSTRUCTION 605442 SECTION 2A. ON MACHINES WIRED TO 609400C-L WITH CARBON ROLLS THE PWC 9 AND SIGNAL FUSE 7 LEADS MUST BE TAPED UP.

12. MOVE JUMPER FROM 4-4C TO 4-4N WHICH CONNECTS TO 2-5C. THIS MAY ALREADY HAVE BEEN DONE IF B/M 605420 HAS BEEN INSTALLED.

ADD THE FOLLOWING, REFERRING TO SEC 7A AND 8A OF 605437 OR 605438:

JUMPER 129245 FROM 7-5T TO 4-4C.

CAPACITOR 610083 FROM PMT 89A (UPPER TERMINAL) TO PMT 89 B (MIDDLE TERMINAL)

RESISTOR 615390 FROM PMT 89A (UPPER TERMINAL) TO RD 86 A (UPPER TERMINAL).

JUMPER 12162 FROM GT27 TO DU5-AU COM ONLY ON W/D 609400C-J WITHOUT CARBON ROLLS.

DIODE 603793 FROM 7-5C TO 7-5N (POLARITY AS SHOWN).

JUMPER 129245 FROM 7-5N TO 4-4T

1K RESISTOR 315970 FROM 4-4T TO 25-4C.

13. FOR MACHINES EQUIPPED WITH PUNCH FEED READ, REFER TO NEW PFR W/D SHEET 605441 AND MAKE THE FOLLOWING CHANGE: MOVE THE WIRE CONNECTING R59-4T AND R25-2T FROM 25-2T TO RESISTOR DIODE TERMINAL RD 14B. ADD JUMPER 129248 BETWEEN R14A AND TO 25-2T. INSTALL RESISTOR ASM 443793, IN POSITION RD 14.

14. WHEN BOTH THE 1402 AND 1401 PORTIONS OF THIS CHANGE ARE COMPLETED BRING UP SYSTEM POWER.

15. THE SOLAR CELL LAMP SHOULD NOW BE LIGHTED AND THE BRILLIANCE VARIABLE WITH THE POTENTIOMETER ON THE TRANSISTOR PANEL. SET POTENTIOMETER AT MAXIMUM CLOCKWISE SETTING.

16. REMOVE THE PLASTIC COVER OVER THE SOLAR CB ASSEMBLY. MEASURE VOLTAGES FROM THE C, E, AID PANEL "GROUND" HUB TO THE SC-TB TERMINALS. (THESE TERMINALS ARE NUMBERED 1-10 LEFT TO RIGHT FACING THE REAR OF THE MACHINE.) AS FOLLOWS:

GROUND TO SC-TB 5-20 VOLTS

GROUND TO SC-TB 6 + 1 TO 2 VOLTS DEPENDING ON POTENTIOMETER SETTING

GROUND TO SC-TB 9 + 6 VOLTS

GROUND TO SC-TB 10-12 VOLTS

IF THE FOREGOING VOLTAGES DO NOT EXIST REMOVE ALL MACHINE POWER AND CORRECT AND WIRING ERRORS.

17. SET CAM SELECTOR ON CE AID PANEL TO POSITION #1 (BRUSH SEL, SW OFF) THE DYNAMIC TIMER ON. DEPRESS NON-PROCESS RUNOUT AND OBSERVE PULSES ON THE READ TIMER DIAL. SET TIMING ACCORDING TO TIMING PROCEDURE 605434. CAUTION: DO NOT TURN MACHINE BY HAND WITH MOTOR CIRCUIT CRIPPLED WITH CARDS IN MACHINE AND START KEY DEPRESSED. REFER TO PROCEDURES IN REFERENCE MANUAL ADDITION 605434 FOR ANY TROUBLE DIAGNOSIS.

18. REMOVE RL CB'S 4 THROUGH 9 LEAVING CAMS ON SHAFT

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME READ SOLAR CIRCUIT		7-20-62	802843-K			X PRINT TO ENG. SPEC. NO.	
BREAKER INSTALLATION		11-13-62	804340			894924	
DESIGN	DEB 5-3-63	MODEL	1402-1	4-9-63	804795		
DETAIL	DFC 7-6-64					USED IN	
CHECK	JK 7-6-64	DRAW				605366	
APPRO	RLS 7-11-64	CHECK					605433

605434

DISCONTINUED

TIMING PROCEDURE

INSTRUCTION

SOLAR CIRCUIT BREAKER PULSE DURATION VARIES WITH LIGHT SOURCE INTENSITY WHILE PULSE TIMING VARIES WITH THE RELATIONSHIP OF THE SLOTTED DISK TO THE LIGHT BEAM. USE EXTREME CAUTION TO AVOID TRANSISTOR DAMAGE FROM SCOPE OR METER LEAD SHORTS BETWEEN TX CARD TERMINALS.

1. ADJUST PULSE DURATION WITH POTENTIOMETER ON RELAY GATE TRANSISTOR PANEL FOR $700 \pm 100 - 0$ MICROSECONDS ($3 \frac{1}{2} \pm \frac{1}{2} - 0$ DEGREES) ON COLD (ROOM TEMPERATURE) MACHINE OR FOR $600 \pm 100 - 200$ MICROSECONDS ($3 \pm \frac{1}{2} - 1$ DEGREES) AT OPERATING TEMPERATURE.

2. COARSE TIMING IS OBTAINED BY LOOSENING THE DISK RETAINING SCREW AND ROTATING TILL THE "9" TIME SLOT IS VISUALLY OPPOSITE THE LIGHT SOURCE WITH POWER REMOVED AND READER HAND CRANKED TO "9" TIME.

3. FINE TIMING ADJUSTMENT IS MADE BY LOOSENING MOUNTING PLATE SCREWS TO ENABLE MOUNTING PLATE TO BE ROTATED WITHIN LIMITS OF SLOTTED HOLES. SEE DRAWING 605431. REPEAT STEP 2 IF MOUNTING PLATE SLOTTED HOLES ALLOW INSUFFICIENT ADJUSTMENT.

ADJUST SO THAT PULSES ARE CENTERED ABOUT MIDPOINTS OF PULSE TIMINGS WITH ANY DEVIATION DISTRIBUTED EQUALLY 9 THROUGH 12 TIMES. THIS DEVIATION SHALL NOT EXCEED ONE DEGREE FROM NOMINAL TIMINGS UNDER CONTINUOUS MACHINE RUNNING AS SHOWN ON THE WIRING DIAGRAM.

ADJUSTMENT PROCEDURE

1. CHECK FOR THE DISK BEING VISUALLY CENTERED Laterally IN THE SLOT IN THE SOLAR CELL MOUNTING BLOCK. ADJUST IF NECESSARY BY LOOSENING SET SCREWS AND REPOSITIONING SPINDLE ON PICKER KNIFE CAM SHAFT.

2. SET THE POTENTIOMETER TO GIVE 1.8 VOLTS ACROSS LAMP TERMINALS (SC TB 4 AND SC TB 6). THIS LAMP VOLTAGE IS A STARTING POINT ONLY WITH THE FINAL SETTING DEPENDENT UPON THE LAMP INTENSITY WHICH WILL PRODUCE A PULSE DURATION AS DESCRIBED IN STEP 1 OF TIMING PROCEDURE ABOVE.

3. REMOVE MACHINE POWER.

4. UNPLUG SOLAR CELL LEADS FROM SC TB 2 AND SC TB 8 AND CONNECT (YELLOW LEAD PLUS) TO METER SET ON A SCALE CAPABLE OF MEASURING VALUES FROM 0 TO 500 MICROAMPS ($\frac{1}{2}$ MA).

5. BRING UP POWER AND HAND CRANK READER WITH CLUTCH MANUALLY TRIPPED TO BRING DISK SLOT OPPOSITE SOLAR CELL. TURN THE MACHINE VERY SLOWLY TO AVOID PASSING INDEX POINTS WHERE METER DEFLECTION OCCURS. A MINIMUM OF 150 MICROAMPS SHOULD BE OBSERVED. ORIENT AND/OR REPLACE LAMP OR SOLAR CELL ASSEMBLIES AS DESCRIBED IN REMOVAL AND REPLACEMENT PROCEDURES TO OBTAIN THE REQUIRED OUTPUT.

REMOVAL AND REPLACEMENT

LAMP ASM

1. REMOVE MACHINE POWER.

2. LOOSEN TWO CONTACT STRAP SCREWS UNTIL LAMP CAN BE SLID OUT OF LAMP HOLDER. UNPLUG LAMP LEAD FROM SC TB 6 AND REMOVE.

3. TO REINSTALL, PLUG LAMP LEAD INTO SC TB 6 AND INSERT LAMP TO FULL DEPTH THROUGH LAMP HOLDER AND RETIGHTEN CONTACT STRAP SCREWS.

4. THE LAMP HOLDER MOUNTING SCREWS MUST BE LOOSENEED TO PERMIT THE PLASTIC LAMP HOLDER TO BE SHIFTED. THIS WILL PERMIT THE LAMP BASE TO SEAT FIRMLY IN THE PLASTIC HOLDER WITH THE LENS END FULLY SEATED AGAINST HOLE IN SOLAR CELL MOUNTING BLOCK.

5. CHECK SOLAR CELL OUTPUT BY SETTING LAMP TERMINAL VOLTAGE AT 1.8 AND MEASURING A MINIMUM OF 150 MICROAMPS ACROSS CELL AT ANY INDEX POINT AS DESCRIBED IN STEP 5 OF ADJUSTMENT PROCEDURES. CELL OUTPUT MAY BE PEAKED BY ROTATING LAMP IN HOLDER. NOTE: DEPRESS END OF CONTACT STRAP TO RELIEVE PRESSURE TO PERMIT ROTATING AND/OR RESEATING LAMP. IT MAY BE NECESSARY IN SOME CASES TO REPOSITION LAMP HOLDER AFTER ROTATION AS IN STEP 4.

SOLAR CELL ASM

1. REMOVE MACHINE POWER.

2. LOOSEN SET SCREW AND REMOVE SOLAR CELL ASSEMBLY. UNPLUG SOLAR CELL LEADS FROM SC TB 2 AND SC TB 8.

3. TO REINSTALL, INSERT CELL INTO CELL MOUNTING BLOCK LEAVING APPROXIMATELY $\frac{1}{4}$ " OF THE METAL SLEEVE EXPOSED ABOVE THE CELL MOUNTING BLOCK. POSITION THE SCRIBED LOCATING MARK SO THAT IT POINTS TOWARD THE LIGHT SOURCE.

4. CONNECT SOLAR CELL LEADS TO METER. CHECK OUTPUT BY SETTING LAMP TERMINAL VOLTAGE AT 1.8. AT AN INDEX POINT MEASURE FOR A MINIMUM OF 150 MICROAMP ACROSS THE CELL AS DESCRIBED IN STEP 5 IN ADJUSTMENT PROCEDURE. TO AVOID DAMAGING CELL, USE CARE WHILE TIGHTENING CELL RETAINING SET SCREW.

5. PLUG SOLAR CELL LEADS INTO SC TB 2 (YELLOW LEAD) AND SC TB 8.

COMPONENT CARD ASM

1. REMOVE MACHINE POWER.

2. UNPLUG (IDENTIFY IF NECESSARY) THE LEADS IN THE SOLAR CELL TERMINAL BLOCK.

3. REMOVE THE LAMP HOLDER MOUNTING SCREWS AND LOWER COMPONENT CARD MOUNTING SCREW. REMOVE COMPONENT CARD ASSEMBLY.

4. TO REINSTALL, REPLACE LAMP HOLDER AND MOUNTING SCREWS. ADJUST LAMP FOR PROPER POSITION ACCORDING TO LAMP ASSEMBLY REMOVAL AND REPLACEMENT STEP 4.

5. PLUG ALL LEADS INTO TERMINAL BLOCK.

INTERNATIONAL BUSINESS MACHINES CORP.		DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.	INSTRUCTION
NAME SOLAR CB REFERENCE		7-20-62	802843K			X PRINT TO ENG. SPEC. NO.		
MANUAL ADDITION		11-13-62	804340			894924		
DESIGN	DEB 5-3-2	MODEL	1402-1			USED IN 605366		
DETAIL	DEB 7-6-2							
CHECK	HCK 7-6-2	DRAW						
APPRO	RLS 7-11-2	CHECK					605434	

C. B. CO. NO. 1379W 4188

DISCONTINUED

TESTING: RUN READ AND PUNCH (AND PFR IS APPLICABLE) TESTS.

AFTER INSTALLATION:

1. CHANGE 1402 WIRING DIAGRAM BY REFERING TO INDEX SHEET AND FOLLOWING INSTRUCTION.
 - a. PAGE REPLACEMENTS:

FOR MACHINES WITH W.D. 609400C-J WITH BRONZE CONTACT ROLLS (WITH 1/2 WRITE) REPLACE PAGES AS FOLLOWS:
 SECTION 7 - 8 WITH NEW PAGE 605437
 SECTION 13 - 14 WITH NEW PAGE 605439
 SECTION 13A - 14A WITH NEW PAGE 605441 IF MACHINE IS EQUIPPED WITH PUNCH FEED READ FEATURE, RETAIN REPLACED PAGES IN BACK OF WIRING DIAGRAM FOR REFERENCE PURPOSES.

FOR MACINES WITH W.D. 609400C-J WITH CARBON CONTACT ROLLS (INSTALLED BY FIELD B/M 605290, 605291, 605292, OR 605293) AND WITH W.D. 609400L, REPLACE PAGES AS FOLLOWS:
 SECTION 7 - 8 WITH NEW PAGE 605438
 SECTION 13 - 14 WITH NEW PAGE 605440
 SECTION 13A - 14A WITH NEW PAGE 605441 IF MACHINE IS EQUIPPED WITH PUNCH FEED READ FEATURE. RETAIN REPLACED PAGES IN BACK WIRING DIAGRAM FOR REFERENCE PURPOSES.
 - b. MARKING CHANGES:

ON ALL MACHINES MARK CHANGES (PREFERABLY WITH A RED PENCIL) AS INDICATED ACCORDING TO WIRING DIAGRAM INSTRUCTIONS 605442, 605443, 605444, 605446, AND 605447.
 - c. PAGE ADDITIONS:

ON ALL MACHINES INSERT ADDITIONAL PAGES BEHIND ORGINAL PAGES AS FOLLOWS:
 SECTION 21-22 FOLLOWED BY 21A-22A 605445
 SECTION 33-34 FOLLOWED BY 33A-34A 605448
 SECTION 35-36 FOLLOWED BY 35A-36A 605449

MARK "SEE B/M 605366 ADDITION" ON THE ORIGINAL SECTIONS 21-22, 33-34, AND 35-36 FOR REFERENCE PURPOSES.
 - d. PARTS CATALOG AND REFERENCE MANUAL ADDITIONS:

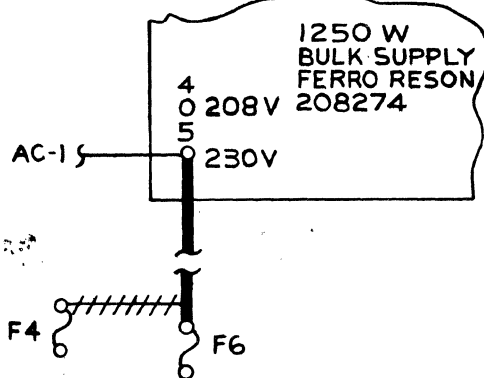
RETAIN PARTS CATALOG ADDITION 605431 AND REFERENCE MANUAL ADDITION 605434 WITH WIRING DIAGRAM.
2. REPORT INSTALLATION AS REQUIRED.
3. SCRAP LOCALLY ANY UNUSED OR REPLACED PARTS.

INTERNATIONAL BUSINESS MACHINES CORP.			DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.	INSTRUCTIONS
NAME	READ SOLAR CB		7-20-62	802843-K			X PRINT TO ENG. SPEC. NO. 894924		
INSTALLATION									
DESIGN	DEB 5-3-6	MODEL 1402-1							
DETAIL	7-6-62								
CHECK	4-6-62	DRAW					USED IN 605366		
APPRO	RCS	7-11-62	CHECK					605436	

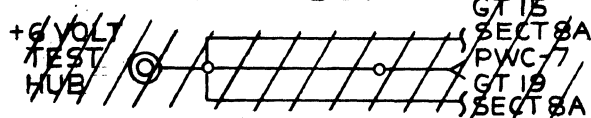
605442

SECTION 1

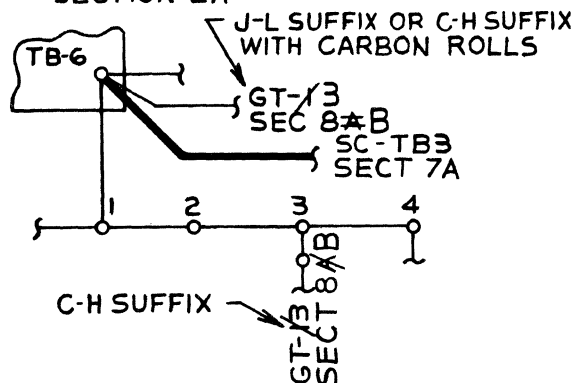
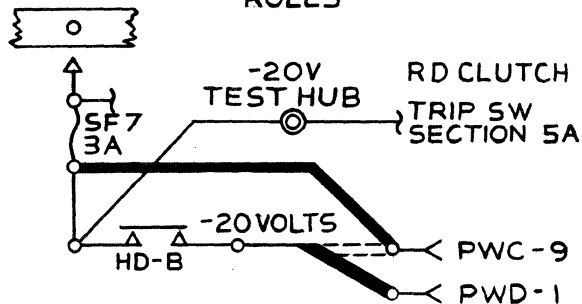
C-J SUFFIX



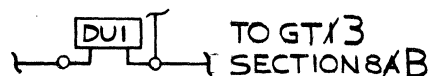
SECTION 2B C-L SUFFIX



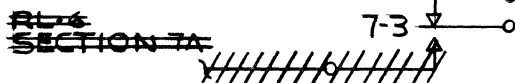
SECTION 2A

C-J SUFFIX
WITHOUT CARBON
ROLLS

SECTION 4A C-L SUFFIX



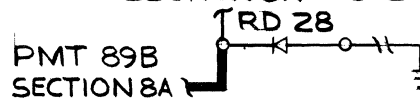
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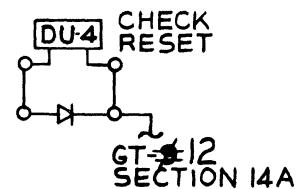
DISCONTINUED

INSTRUCTIONS

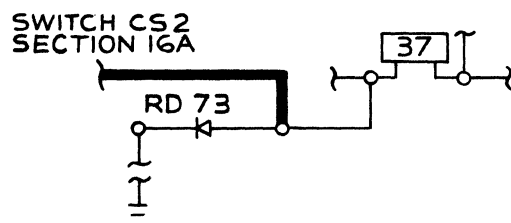
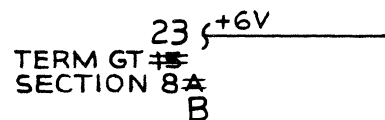
SECTION 6A C-L SUFFIX



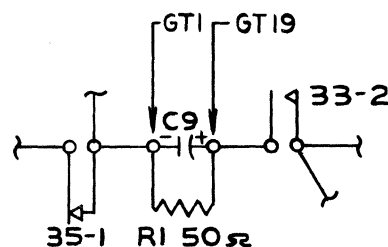
SECTION 6B C-L SUFFIX



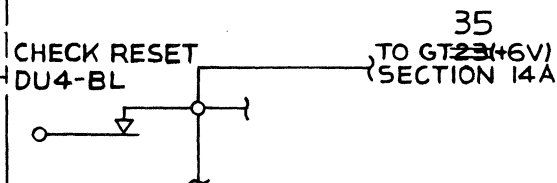
SECTION 11B C-L SUFFIX

SECTION 11B D-L SUFFIX
PCH NP. RO. KEY 2

SECTION 12B C-L SUFFIX



SECTION 12A C-L SUFFIX



INTERNATIONAL BUSINESS MACHINES CORP.

NAME SOLAR CB WIRING
DIAGRAM CHANGES

DESIGN 020 5-24-62 MODEL 1402-1

DETAIL 020 7-6-62

CHECK 020 7-6-62 DRAW

APPRO 020 7-11-62 CHECK

DATE

CHANGE NO.

DATE

CHANGE NO.

NOTE

X PRINT TO ENG. SPEC. NO.
894924USED IN
605366

DEVELOPMENT NO.

605442

INSTRUCTIONS

FIELD USE

INDEX

605893-B

INDEX

1402-1 FEATURE WIRING DIAGRAM

INSTALL PROCESS METER

SECTION

NAME

PART NUMBER

ENGINEERING CHANGE NUMBER

A
INST.
INST.

W/D PROCESS METER
INSTRUCTION
INSTRUCTION

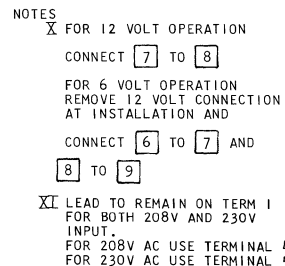
635057
635058
635059

805888-H
805888-H
805888-E

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	INSTALL PROCESS METER			9-16-63	805888A			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN	AGG 9-6-63	MODEL	1402-1	10-24-63	805888-E				
DETAIL	AGG 9-6-63			11-8-63	805888-H				
CHECK	HEM 9-11-63	DRAW							
APPRO	HEM 9-11-63	CHECK							

605893-B

INDEX



INTERNATIONAL BUSINESS MACHINES CORP.						DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME		PROCESS METER				9-16-63	805888 A			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN		AGG	9-6-63		MODEL	1402-11	805888E			WHERE USED 605893 AND 610436	
DETAIL		AGG	9-6-63				805888H				
CHECK	HEM	9-11-63		DRAW	CDI	9-6-63					
APPRO	HEM	9-11-63		CHECK	LJW	9-6-63					

FIELD USE

INSTRUCTION

635058

INSTRUCTION

PROCESS METER

PREREQUISITES: NONE

SPECIAL TOOLS: SEE MECHANICAL INSTALLATION- SECTION A

INSTALLATION TIME: SECTION A 1.4 HOURS----SECTION B 2.1 HOURS----PREPARATION, TEST, UPDATING 1.0 HOURS. TOTAL INSTALLATION TIME 4.5 HOURS

PURPOSE: METERING

DESCRIPTION: INSTALL PROCESS METER; POWER BOX ASM AND CONTROLLING CIRCUITS.

INSTALLATION: REMOVE ALL POWER TO MACHINE DURING INSTALLATION OF ANY SECTION. THIS INSTRUCTION IS MADE IN TWO SECTIONS. THE SYSTEM MAY BE OPERATED NORMALLY UPON THE COMPLETION OF SECTION A.

A. MECHANICAL INSTALLATION (NOTE: IF HOLES FOR MOUNTING METER HAVE PREVIOUSLY BEEN ADDED TO MACHINE COVER, REMOVE AND DISCARD SPECIAL FACE PLATE COVERING THE HOLES, OMIT SPECIAL TOOLS 1.A. AND 1.B. AND OMIT STEPS 3.B. THRU 3.G.)

1. SPECIAL TOOLS
 - A. 7/8 DIA PUNCH #460139
 - B. 3/8 DIA DRILL WITH 1/4 DIA SHANK #450371
 - C. #4 DRILL #450298
2. POWER BOX MOUNTING
 - A. OPEN REAR MACHINE COVERS, AND REMOVE ALL SIGNAL AND POWER CONNECTING CABLES FROM CONNECTOR PANEL.
 - B. LOWER THE CONNECTOR PANEL.
 - C. TAPE TEMPLATE FIGURE #4 ON THE INSIDE OF THE CONNECTOR PANEL AS INDICATED ON THE TEMPLATE. NOTE THAT THE TEMPLATE IS TO BE LOCATED CENTRALLY BETWEEN THE PC AND RC CONNECTORS.
 - D. COVER PC AND RC CONNECTORS.
 - E. CENTER PUNCH THE THREE HOLES IN THE CONNECTOR PANEL AND DRILL THE HOLES WITH THE #4 DRILL.
 - F. MOUNT POWER BOX ON INSIDE OF PANEL WITH SCREW 186759 (3). BEFORE MOUNTING POWER BOX, WIRE TRANSFORMER. PRIMARY PER NOTE XI ON METER WIRING DIAGRAM.
 - G. IF NECESSARY, RE-ROUTE CABLES IN AREA TO CLEAR THE BOX AND TIE IN PLACE.
3. METER MOUNTING (USE FIGURES ON REF DWG. 610409)
 - A. REMOVE TOP BRIDGE COVER. BE CAREFUL ONLY TO REMOVE THE FOUR NUTS MOUNTING THE COVER TO THE BRACKET AND NOT THE NUTS THAT MOUNT THE BRACKET TO THE FRAME. REMOVING OR LOOSENING OTHER FASTENERS WILL AFFECT COVER POSITIONING AND WILL CAUSE PROBLEMS AT RE-ASSEMBLY.
 - B. TAPE PAPER TEMPLATE (FIGURE #1 ON DWG. 610409) ON COVER AS SHOWN IN FIGURE #2.
 - C. PLACE THREE BOXES OF USED IBM CARDS ON FLOOR AND LAY COVER OVER THE BOXES. THE CARDS WILL PROVIDE SUPPORT FOR OPERATIONS #D AND E.
 - D. CENTER PUNCH HOLES INDICATED ON FIGURE #1.
 - E. DRILL 3/8 DIA HOLE THROUGH ALL FIVE CENTER PUNCHED HOLES. THE 3/8 DIA HOLE ON THE THREE CENTER HOLES WILL ACT AS A GUIDE FOR PUNCHING THE FINAL 7/8 DIA HOLES.
 - F. PUNCH THE THREE 7/8 DIA HOLES AS INDICATED IN FIGURE #1. PUNCH THE TWO OUTSIDE HOLES FIRST AND THEN POSITION THE POINTS OF THE PUNCH ON THE REMAINING TABS TO BE CUT AND PUNCH OUT THE THIRD HOLE. (SEE FIGURE #5 FOR PUNCH POSITIONING).
 - G. FILE SHARP CORNERS OUT OF LARGE OPENING AS SHOWN ON FIGURE #1.
 - H. INSTALL METER BOX AS SHOWN IN FIGURE #3.
 - I. SOLDER AND CONNECT APPROPRIATE CABLE WIRES TO METER TERMINALS (REFER TO SECTION B.1.).
 - J. RE-INSTALL BRIDGE COVER.

B. ELECTRICAL INSTALLATION

REFERENCE THE MACHINE W/D 609400 AND B/M DRAWINGS ETC. PROVIDED IN THIS PACKET DURING INSTALLATION. (USE VOLT - OHM METER ONLY, FOR TESTING)

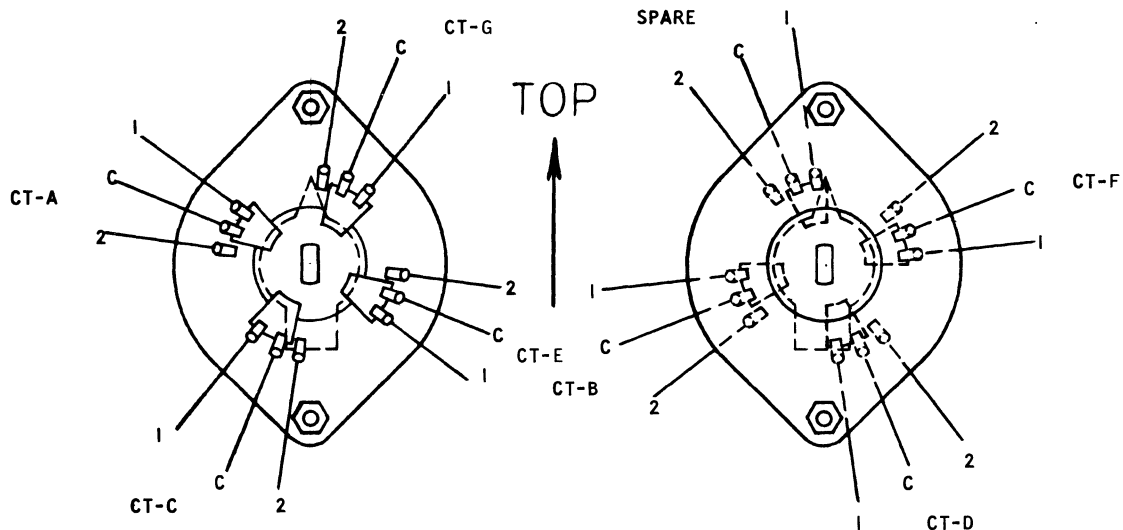
1. WITH THE PROCESS METER POWER BOX AND CABLE ASM MOUNTED ON THE BACK OF THE REAR CONNECTOR PANEL, IN THE AREA INDICATED, ROUTE AND CONNECT THE REMAINING CABLES. REFER TO CABLE DRAWINGS 610412, 610415 AND THE PROCESS METER W/D 635057. INSTALL PROCESS METER CABLE IN CABLE CLAMP ON METER GROUND TERMINAL (SEE FIGURE #3) ON 610409. REMOVE BRADY LABELS FROM CABLE 610412 UPON INSTALLATION, TO CONFORM WITH SAFETY REQUIREMENTS.
2. INSTALL ROTARY SWITCH P/N 610556 IN PLACE OF PRESENT ON LINE OFF LINE SWITCH, IF EXISTING SWITCH DOES NOT HAVE A VACANT CIRCUIT, UTILIZING EXISTING SWITCH MOUNTING HARDWARE. REFER TO INSTRUCTION SHEET 635059 FIGURES 1 AND 2 AND W/D 609400 SECTION 21 B WHEN TRANSPOSING WIRES.
3. CHECK ALL WIRING AGAINST WIRING DIAGRAM. CLOSE CONNECTOR PANEL AND COVERS.

INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.
NAME	PROCESS METER			9-16-63	805888A			X PRINT TO ENG. SPEC. NO. 894924	
DESIGN	ACG	9-6-63	MODEL	1402-1	10-24-63	805888E			
DETAIL	AGG	9-6-63			11-8-63	805888-H		WHERE USED 605893	
CHECK	WEM	9-11-63	DRAW						635058
APPRO	WEM	9-11-63	CHECK						

INSTRUCTION

635059

CONTROL TRANSFER "ON-LINE-OFF-LINE"
SWITCH FOR 1402-1
(VIEWED FROM BACK IN ON-LINE POSITION)



TOP SIDE DETAIL
FIGURE 1

UNDER SIDE DETAIL
FIGURE 2

REPLACEMENT PARTS LIST

NAME	PART NO.
TRANSFORMER	740473
SMS CARD	372700
REED RELAY (ON 372700 CARD)	765654
PM RELAY	719005
METER CARD	372688
REED RELAY (ON 372688 CARD)	767036
ETM CLOCK	740503

ELECTRICAL INSTALLATION (CONT.)

4. TEST-OPERATIONAL

A. THE METER WILL RECORD WHEN THE FOLLOWING CONDITIONS EXIST:

1. CPU
 - A- SIGNAL PRESENT
2. I/O UNIT
 - A- ON LINE-OFF LINE SWITCH SET TO "ON LINE"
 - B- FIRST CARD AT SECOND READ BRUSHES AND/OR FIRST CARD AT PUNCH STATION.

B. THE METER WILL HALT WHEN THE FOLLOWING CONDITIONS EXIST:

1. CPU
 - A- SIGNAL NOT PRESENT
2. I/O UNIT
 - A- ON LINE-OFF LINE SWITCH SET TO "OFF LINE"
 - B- LAST CYCLE WHEN CARD OR CARDS FEED OUT OF BOTH FEEDS.

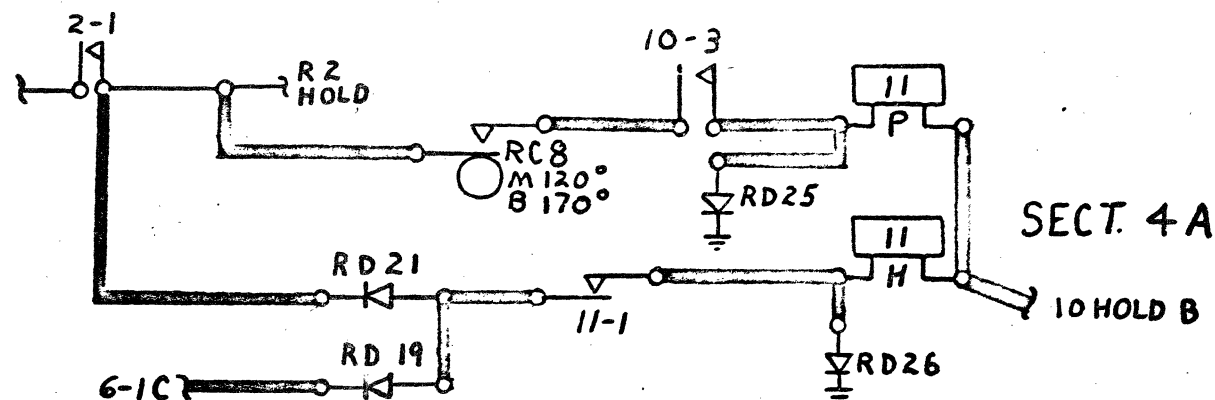
C. AFTER INSTALLATION

1. RUN STANDARD SYSTEM PUNCH AND READ DIAGNOSTIC TESTS, RIPPLE READ, RIPPLE PUNCH AND PUNCH FEED READ ON MACHINES WITH PFR FEATURE, OBSERVING CORRECT PROCESS METER OPERATION AS OUTLINED IN STEP 4.
2. INSERT REF MATERIAL IN WIRING DIAGRAM BINDER.

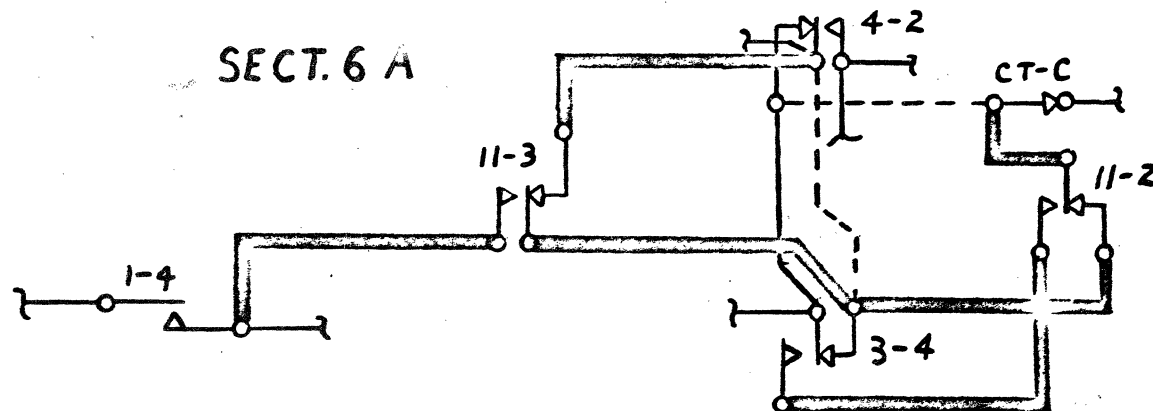
INTERNATIONAL BUSINESS MACHINES CORP.				DATE	CHANGE NO.	DATE	CHANGE NO.	NOTE	DEVELOPMENT NO.	INSTRUCTION
NAME PROCESS METER				9-16-63	805888-A			X PRINT TO ENG. SPEC. NO. 894924		
DESIGN AGG 9-6-63 MODEL 1402-1				10-24-63	805888-E			WHERE USED 605893		
DETAIL AGG 9-6-63										
CHECK WSM 9-11-63 DRAW										
APPRO WSM 9-11-63 CHECK										
									635059	

STANDARDS CODE	TECHNICAL SERVICES APPRO	SYM	DATE	CHANGE NO	TECH APPRO	SYM	DATE	CHANGE NO	TECH APPRO	DEVELOPMENT NO	Q/M
17-15	ELEC		8-29-61	602617							
RELEASED FOR ASM	QTY										
										605295	

DISCONTINUED



DIODE IDENTIFICATION
+ , OR RED DOT



IBM MATERIAL	NO	TOLERANCE UNLESS OTHERWISE NOTED	MUST CONFORM TO ENG SPEC 390350	INTERNATIONAL BUSINESS MACHINES CORP
CASE DEPTH		2 PLACE DEC ±	ALIGNMENT WITHIN NOTE I	NAME NO. 1 CARD LEVER DELAY
HARDNESS		3 PLACE DEC ±	CONC TO DU WITHIN TIR NOTE II	DESIGN RHC 6-22-61 TYPE
SURFACE TREATMENT		ANGLES ±	FLAT WITHIN NOTE III	DETAIL RHC 6-22-61 SCALE
		CORNERS AND/OR EDGES BROKEN OUTSIDE MAX	PARALLEL TO DU WITHIN NOTE IV	CHECK RHC 6-27-61 DRAW RHC
		INSIDE MAX	STRAIGHT WITHIN NOTE V	APPRO RHC 6-27-61 CHECK
			SQUARE TO DU WITHIN NOTE VI	

IBM INSTALLATION INSTRUCTIONS

NO. 605295

☐ ACTIVE
☐ OBSOLETE
☒ DISCONTINUED

NAME	WHERE USED	APPROVALS	DATE		
NO. 1 CARD LEVER DELAY	1402		6-26-61	Made By RPC	SHEET <u>1</u> OF <u>5</u>
				Approved By RLS	Date Prepared 6-27-61

REFERENCE		Ck.																																																																
Drawing	Fig.	Col.																																																																
			<p>1 PREPARATION:</p> <p>A READ INSTRUCTIONS COMPLETELY AND STUDY INSTRUCTION DRAWINGS, TO BECOME ACQUAINTED WITH PROCEDURES AND PARTS USED. A CHECK COLUMN (CK. COL.) IS PROVIDED FOR CUSTOMER ENGINEERS TO CHECK OFF EACH ITEM AS COMPLETED.</p> <p>B CHECK BILL OF MATERIAL TO DETERMINE THAT ALL PARTS WERE RECEIVED. PROCURE ANY MISSING PARTS BEFORE BEGINNING INSTALLATION. ARRANGE PARTS AT THE MACHINE IN THE ORDER OF INSTALLATION AS FOLLOWS:</p> <table border="0"> <thead> <tr> <th>PART NUMBER</th> <th>NAME</th> <th>QUANTITY</th> </tr> </thead> <tbody> <tr><td>602113</td><td>CAM ASM</td><td>1</td></tr> <tr><td>602083</td><td>CIRCUIT BREAKER</td><td>1</td></tr> <tr><td>2031</td><td>SCREW</td><td>1</td></tr> <tr><td>1090873</td><td>L WASHER</td><td>1</td></tr> <tr><td>24511</td><td>WASHER</td><td>1</td></tr> <tr><td>38051</td><td>NUT</td><td>1</td></tr> <tr><td>257974</td><td>SET SCREW</td><td>1</td></tr> <tr><td>344599</td><td>MOULDING</td><td>1</td></tr> <tr><td>159944</td><td>CLIP</td><td>1</td></tr> <tr><td>198363</td><td>SCREW</td><td>2</td></tr> <tr><td>719005</td><td>RELAY</td><td>1</td></tr> <tr><td>602955</td><td>DUST COVER</td><td>1</td></tr> <tr><td>802175</td><td>DIODE</td><td>2</td></tr> <tr><td>129243</td><td>JUMPER</td><td>4</td></tr> <tr><td>441318</td><td>DIODE</td><td>2</td></tr> <tr><td>205331</td><td>JUMPER</td><td>1</td></tr> <tr><td>601453</td><td>WIRE #22 BLUE</td><td>35FEET</td></tr> <tr><td>187243</td><td>PLUG</td><td>25</td></tr> </tbody> </table> <p>SPECIAL TOOLS AND EQUIPMENT: NONE</p> <p>INSTALLATION TIME: 2 HOURS</p> <p>PURPOSE: TO DETECT A FAILURE OF READ CARD LEVER NO. 2.</p>							PART NUMBER	NAME	QUANTITY	602113	CAM ASM	1	602083	CIRCUIT BREAKER	1	2031	SCREW	1	1090873	L WASHER	1	24511	WASHER	1	38051	NUT	1	257974	SET SCREW	1	344599	MOULDING	1	159944	CLIP	1	198363	SCREW	2	719005	RELAY	1	602955	DUST COVER	1	802175	DIODE	2	129243	JUMPER	4	441318	DIODE	2	205331	JUMPER	1	601453	WIRE #22 BLUE	35FEET	187243	PLUG	25
PART NUMBER	NAME	QUANTITY																																																																
602113	CAM ASM	1																																																																
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24511	WASHER	1																																																																
38051	NUT	1																																																																
257974	SET SCREW	1																																																																
344599	MOULDING	1																																																																
159944	CLIP	1																																																																
198363	SCREW	2																																																																
719005	RELAY	1																																																																
602955	DUST COVER	1																																																																
802175	DIODE	2																																																																
129243	JUMPER	4																																																																
441318	DIODE	2																																																																
205331	JUMPER	1																																																																
601453	WIRE #22 BLUE	35FEET																																																																
187243	PLUG	25																																																																
ENG. CHANGE	DATE NO.	6-27-61 802617	12-21-61 802617-A						DATE TYPED 1-2-62 kic																																																									